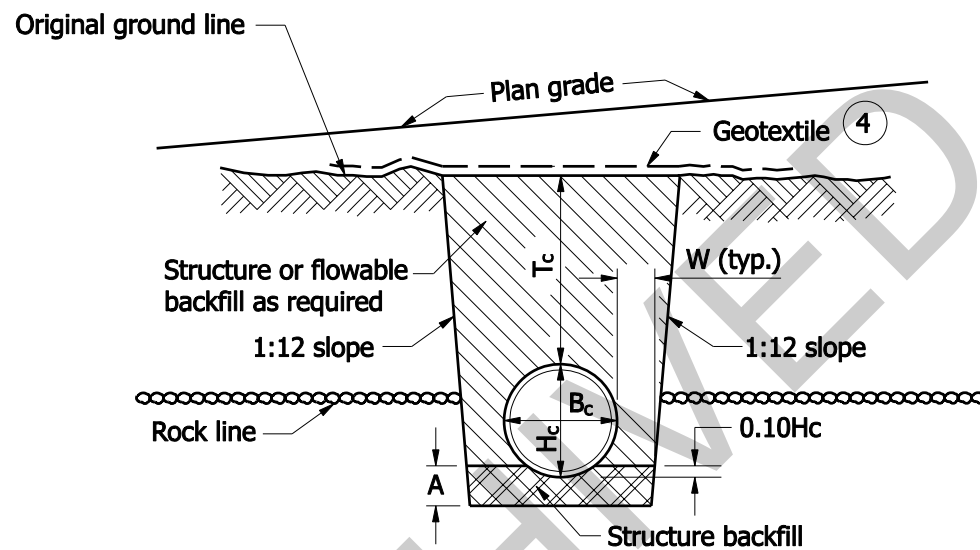


SECTION A-A



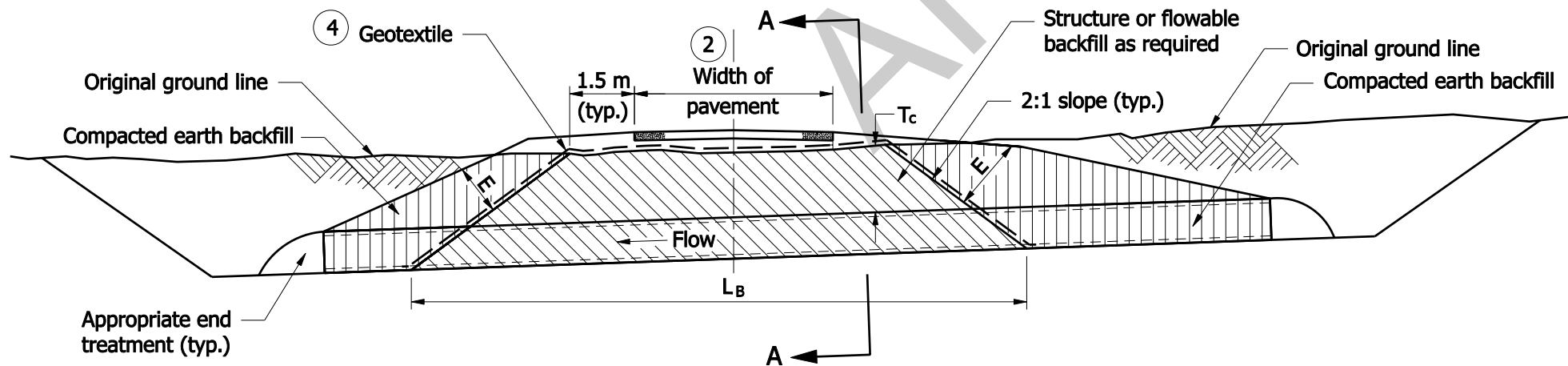
SECTION A-A
ROCK FOUNDATION

LEGEND

- H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 200 min. for fill height less than 5.0 m
= 300 min. for fill height of 5.0 m or more
 T_c = Trench cover depth over pipe
 W = $0.3 B_c$ or 230, whichever is greater
 E = Encasement
 L_B = Backfill length measured from toe to toe of the 2:1 slopes.

NOTES :

1. Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - a.) 0.5 m for $B_c \leq 450$
 - b.) 0.9 m for $18" < B_c \leq 1350$
 - c.) 1.2 m for $B_c > 1350$
2. For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
3. Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 0.6 m. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 0.6 m encasement.
4. Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench or toe of slope.

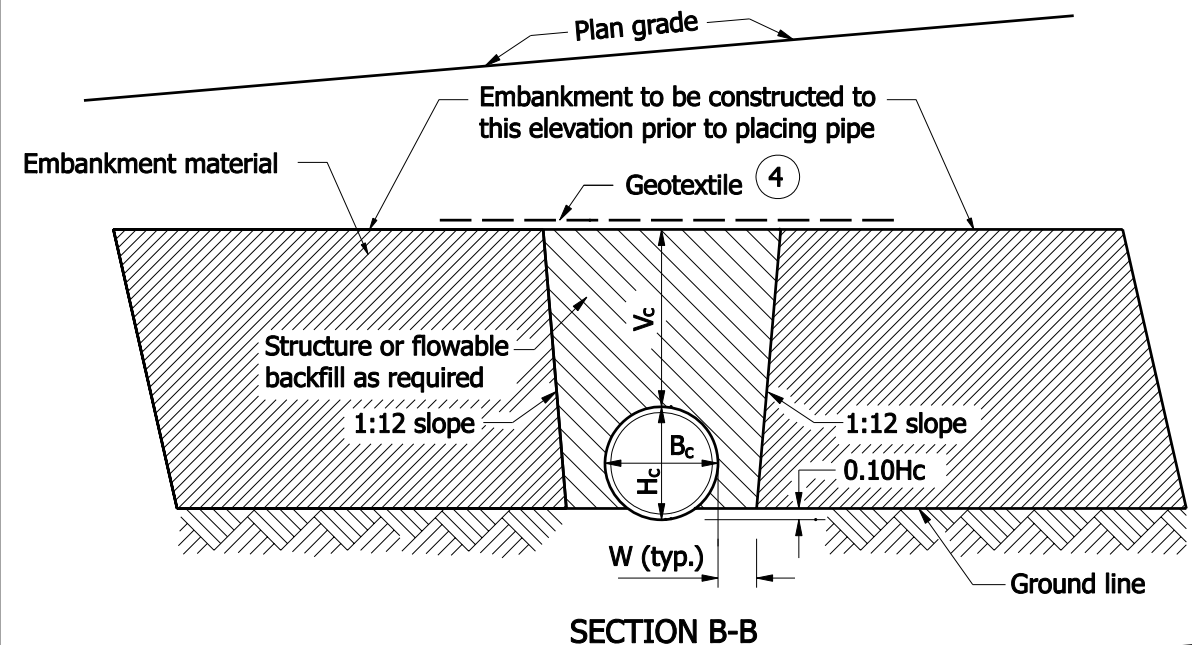


ELEVATION

All Dimensions are in mm unless otherwise specified.

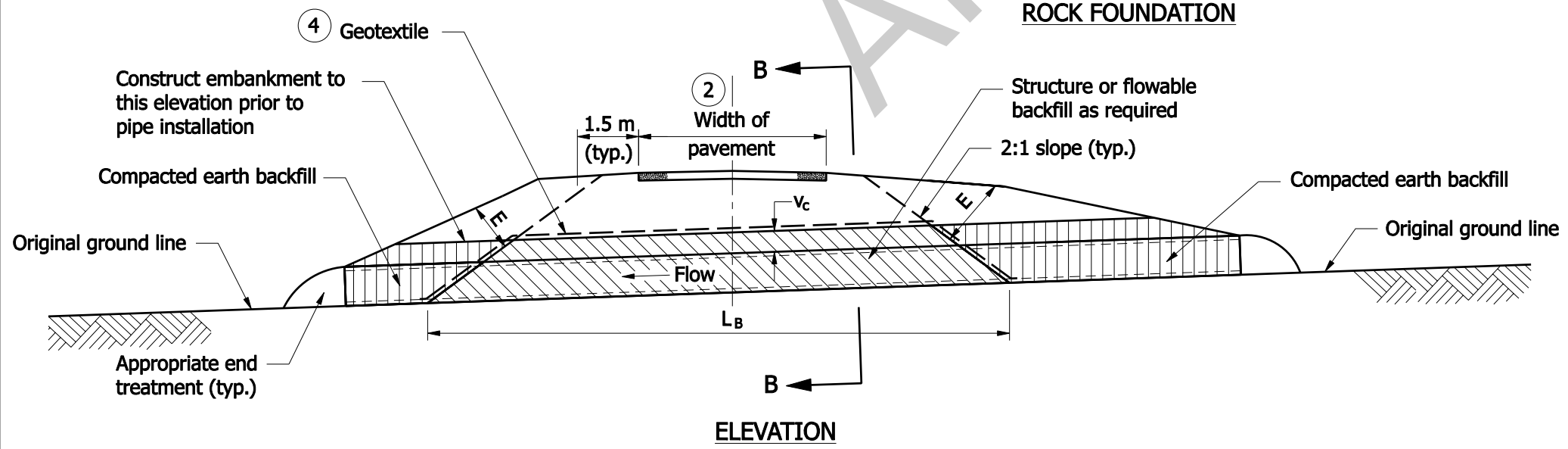
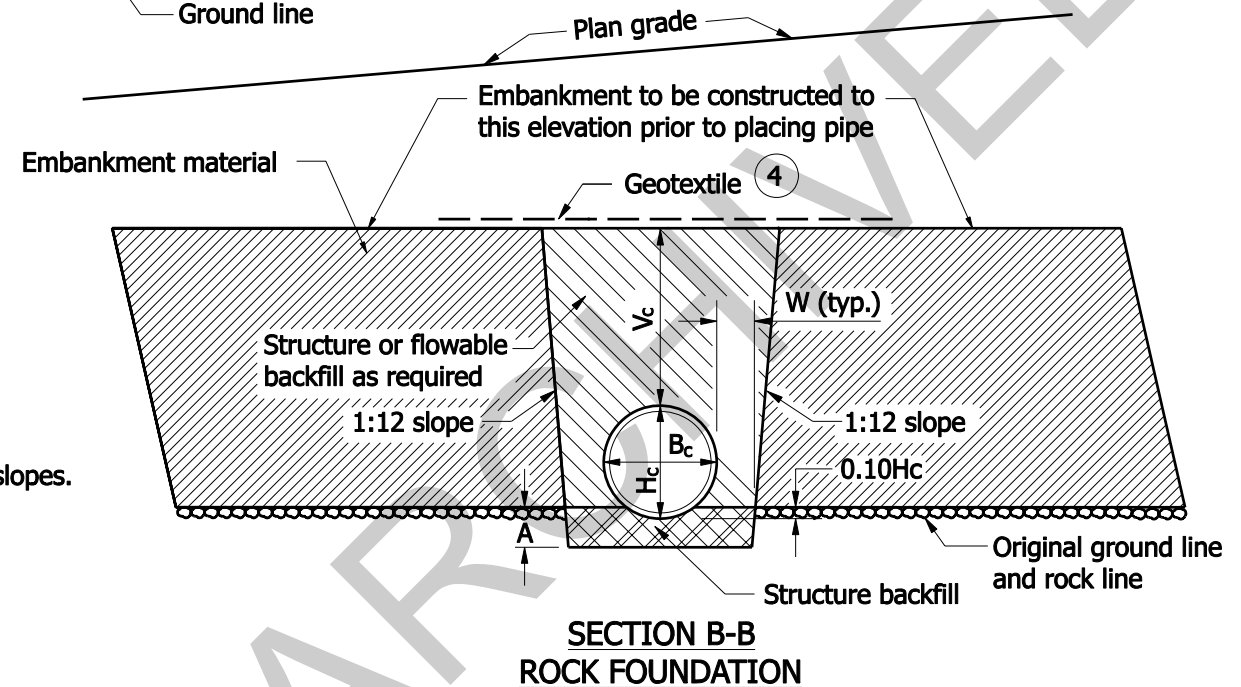
INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 1
NEW ROADWAY, TRENCH



LEGEND

- H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 200 min. for fill height less than 5.0 m
= 300 min. for fill height of 5.0 m or more
 V_c = 300 for $B_c \leq 450$
= 450 for $B_c > 450$
 W = $0.3 B_c$ or 230, whichever is greater
 L_B = Backfill length measured from toe to toe of the 2:1 slopes.



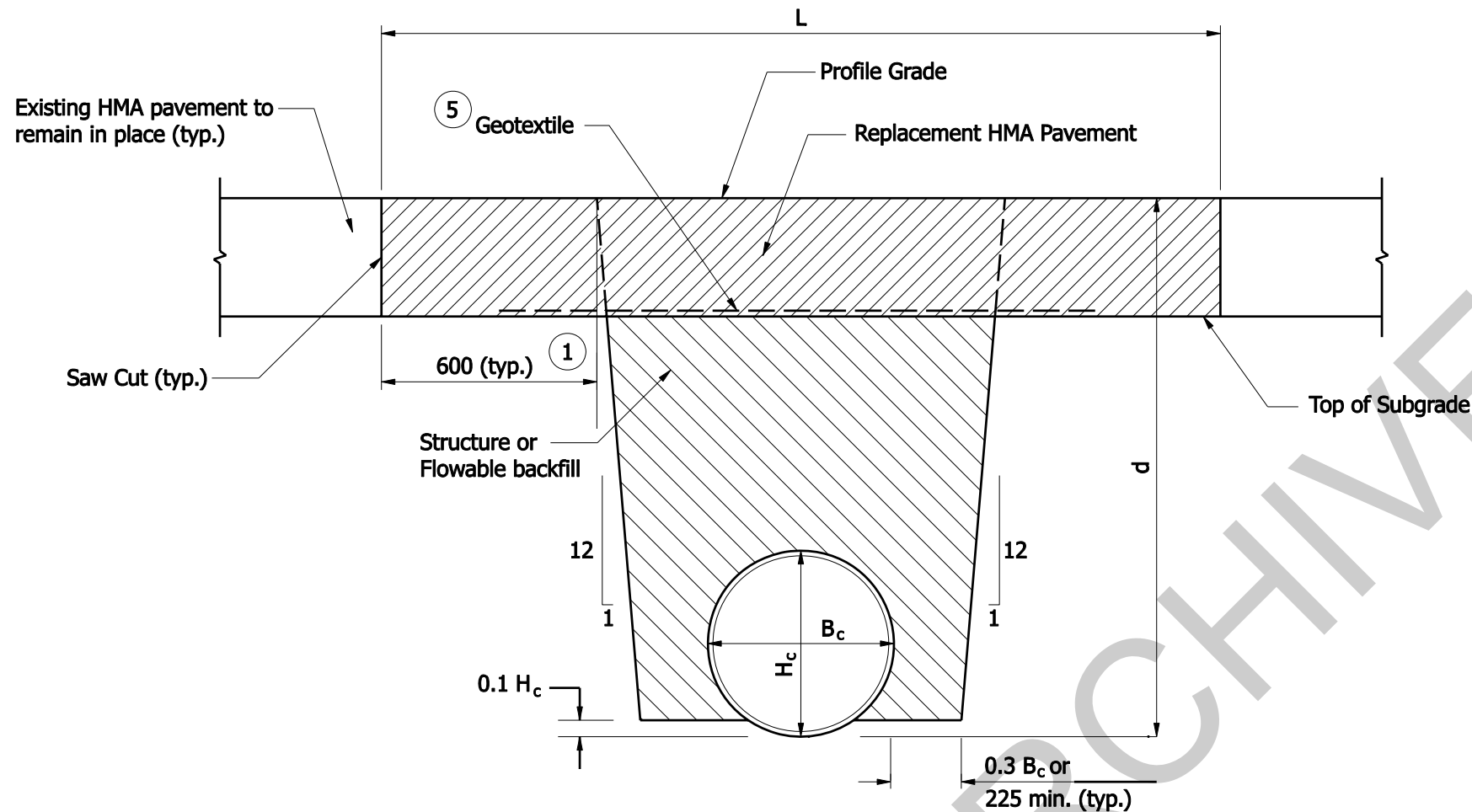
NOTES :

1. Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
a.) 0.5 m for $B_c \leq 450$
b.) 0.9 m for $18" < B_c \leq 1350$
c.) 1.2 m for $B_c > 1350$
- 2 For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
3. Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 0.6 m. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 0.6 m encasement.
- 4 Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench or toe of slope.

All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 1
NEW ROADWAY, EMBANKMENT



L = Pay limits of pavement removal and pavement replacement (m);
for cross pipe, measured along roadway centerline; for pipe parallel to
roadway centerline, measured perpendicular to pipe centerline.

B_c = Overall diameter or span (mm)

H_C = Overall diameter or rise (mm)

d = Vertical distance from flowline to profile grade (m)

HMA REPLACEMENT PAVEMENT

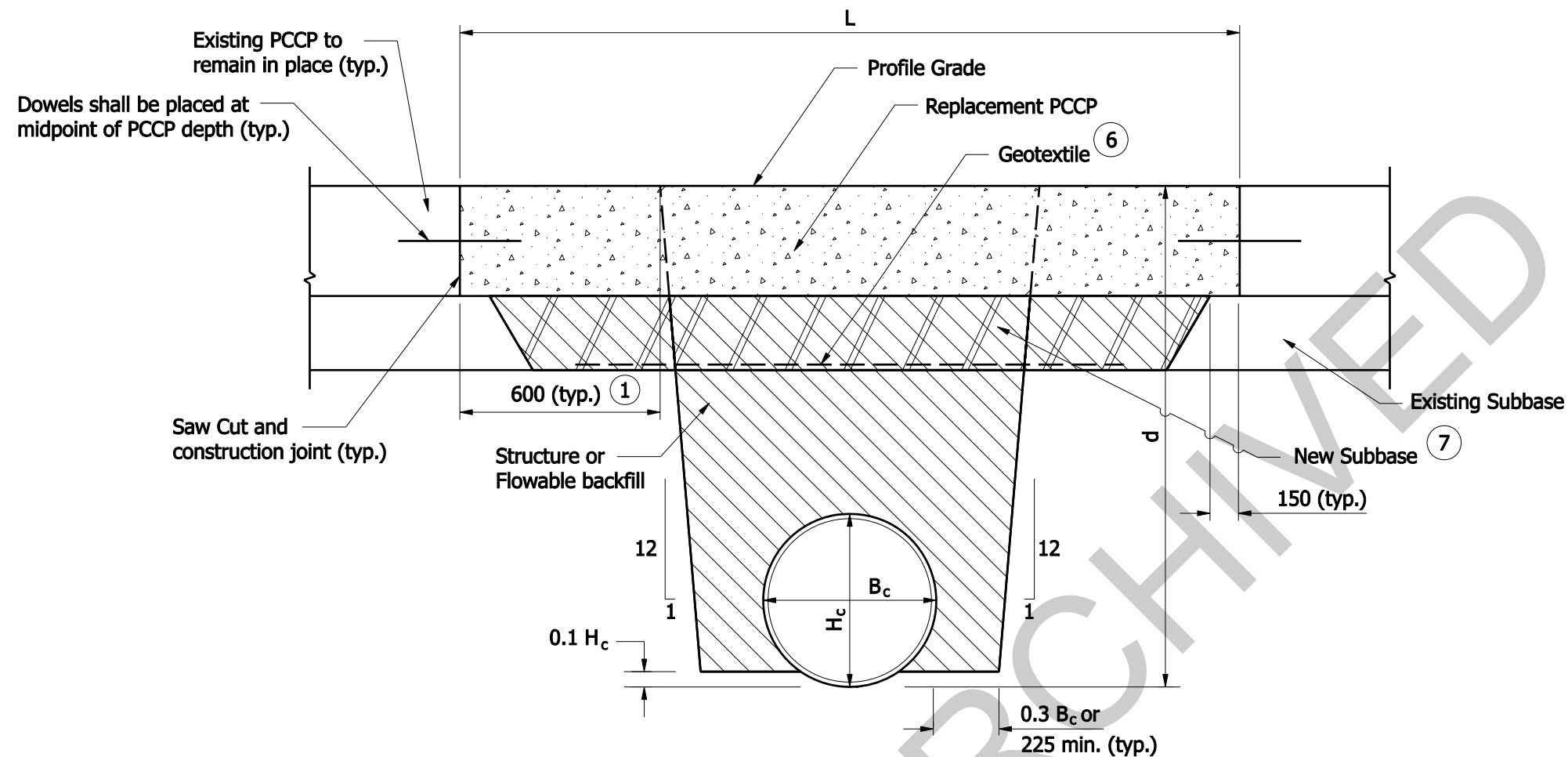
NOTES :

- 1 Existing subgrade over this distance shall remain in place.
2. The minimum pavement sections shall be as follows:
HMA: 90 kg/m² HMA Surface, Type A,B,C or D on
variable HMA Intermediate, Type A, B, C or D
3. If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing 718-UNDR-01.
4. See Standard Drawing 715-BKFL-01 for pipe backfill trench elevation view.
- 5 Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench.

All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 1 EXISTING ROADWAY, TRENCH



- L = Pay limits of pavement removal and pavement replacement (m); for cross pipe, measured along roadway centerline; for pipe parallel to roadway centerline, measured perpendicular to pipe centerline.
- B_c = Overall diameter or span (mm)
- H_c = Overall diameter or rise (mm)
- d = Vertical distance from flowline to profile grade (m)

PCCP REPLACEMENT PAVEMENT

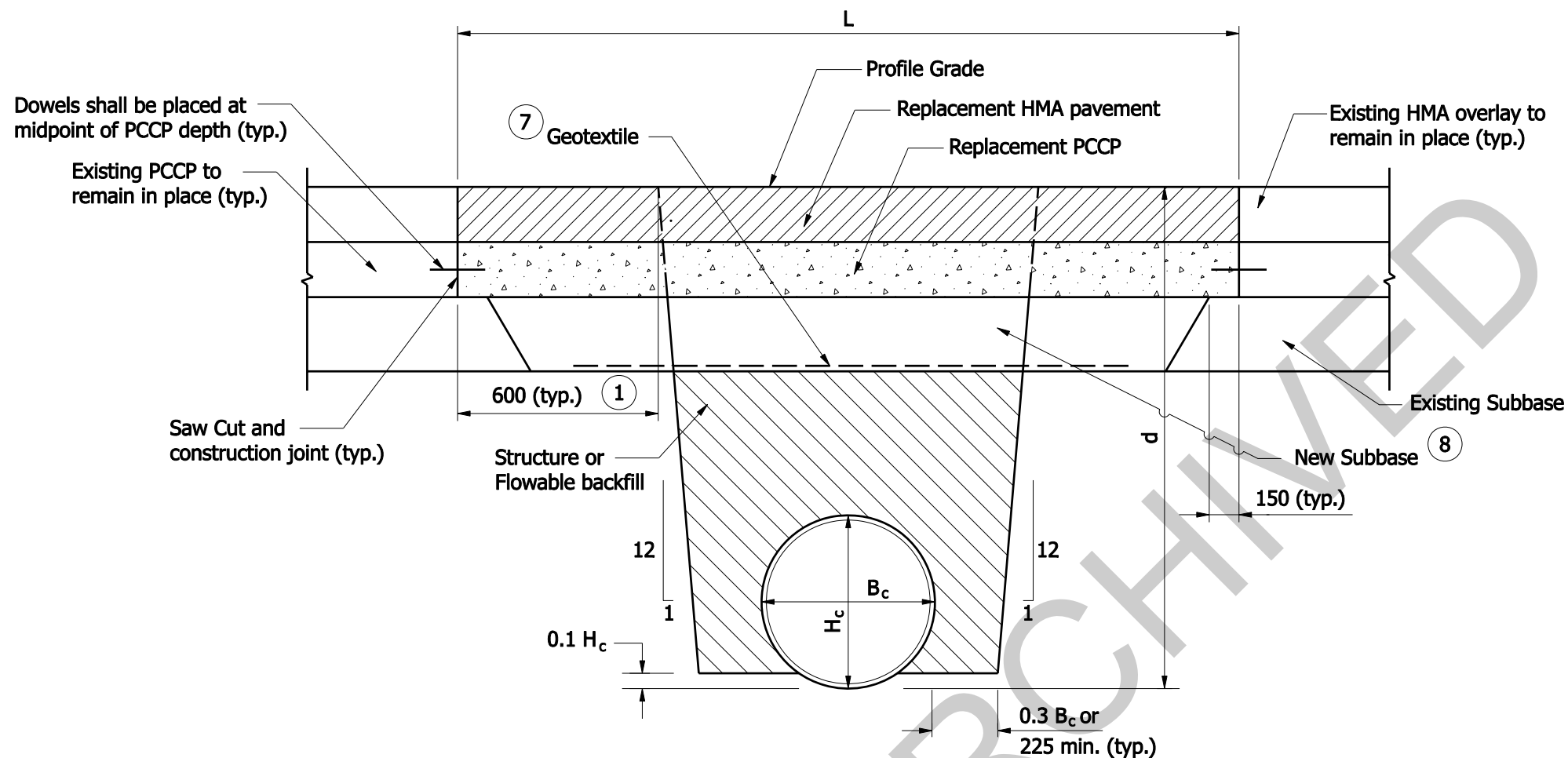
NOTES :

- ① Existing subgrade over this longitudinal distance shall remain in place.
2. The thickness of the replacement PCCP shall match that of the existing concrete pavement.
3. See Standard Drawing 506-CCPP-01 for subbase, dowels, and construction joint details.
4. If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing 718-UNDR-01.
5. See Standard Drawing 715-BKFL-01 for pipe backfill trench elevation view.
- ⑥ Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench.
- ⑦ New subbase type shall match the existing subbase type and thickness.

All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL, METHOD 1
EXISTING ROADWAY, TRENCH



- L = Pay limits of pavement removal and pavement replacement (m);
for cross pipe, measured along roadway centerline; for pipe parallel to
roadway centerline, measured perpendicular to pipe centerline.
- B_c = Overall diameter or span (mm)
- H_c = Overall diameter or rise (mm)
- d = Vertical distance from flowline to profile grade (m)

COMPOSITE REPLACEMENT PAVEMENT

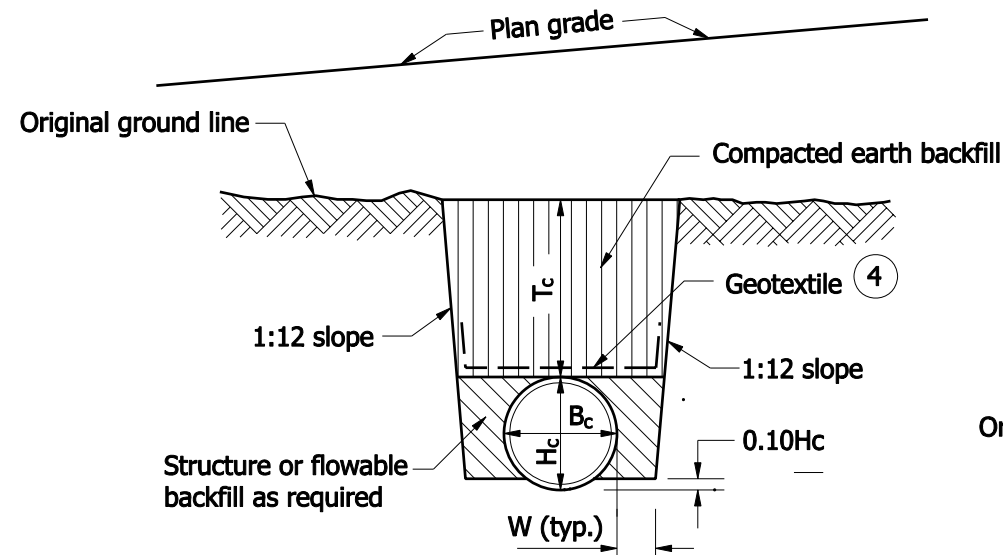
NOTES :

- Existing subgrade over this distance shall remain in place.
- The thickness of the replacement PCCP shall match that of the existing concrete pavement.
- The minimum pavement sections shall be as follows:
HMA: 90 kg/m² #/syd HMA Surface, Type A,B,C or D on
variable HMA Intermediate, Type A, B, C or D
- See Standard Drawing 506-CCPP-01 for subbase, dowels, and construction joint details.
- If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing 718-UNDR-01.
- See Standard Drawing 715-BKFL-01 for pipe backfill trench elevation view.
- Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench.
- New subbase type shall match the existing subbase type and thickness.

All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

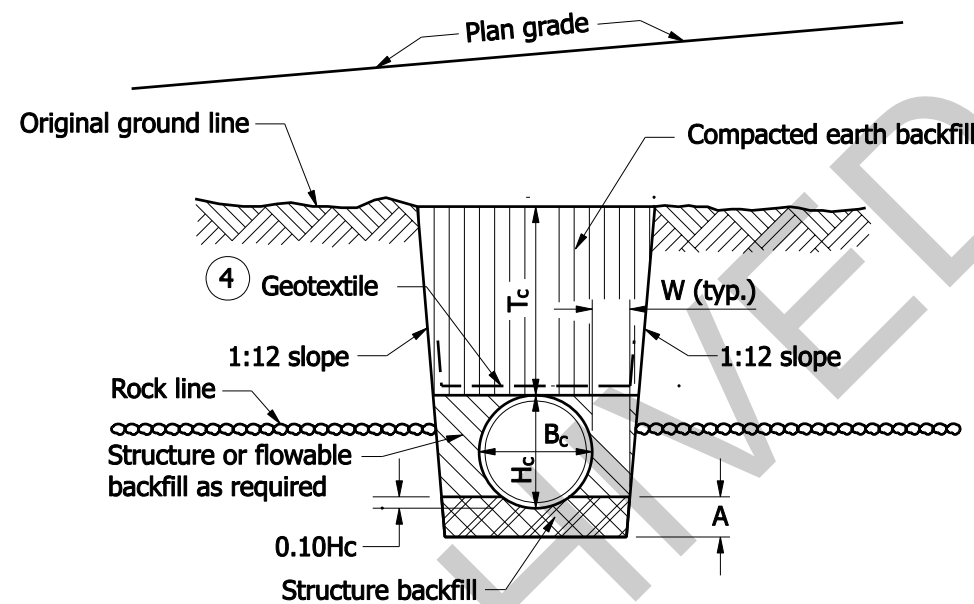
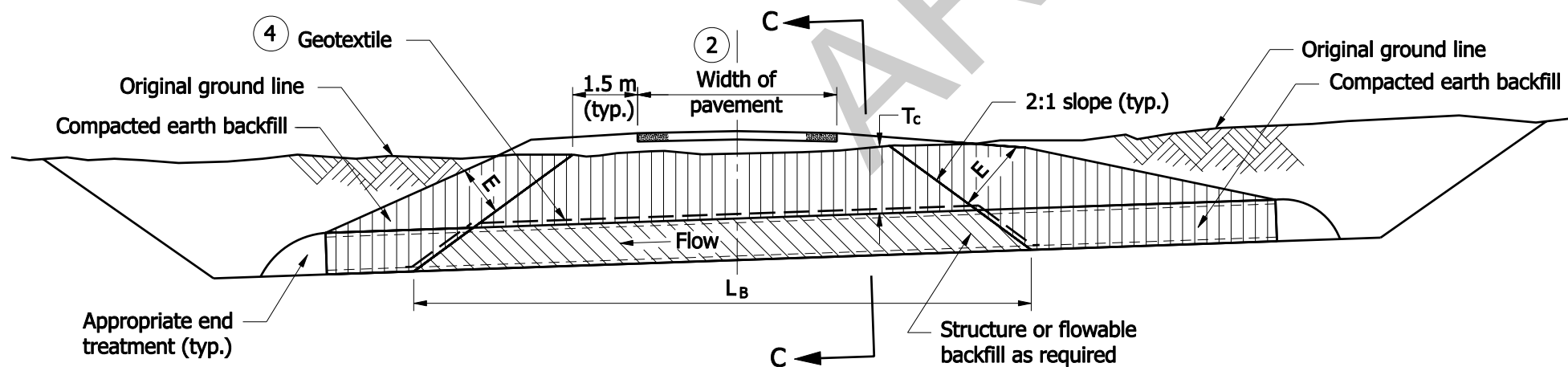
PIPE BACKFILL METHOD 1
EXISTING ROADWAY, TRENCH



SECTION C-C

LEGEND

- H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 200 min. for fill height less than 5.0 m
 = 300 min. for fill height of 5.0 m or more
 T_c = Trench cover depth over pipe
 W = $0.3 B_c$ or 230, whichever is greater
 E = Encasement
 L_B = Backfill length measured from toe to toe of the 2:1 slopes.

SECTION C-C
ROCK FOUNDATION

ELEVATION

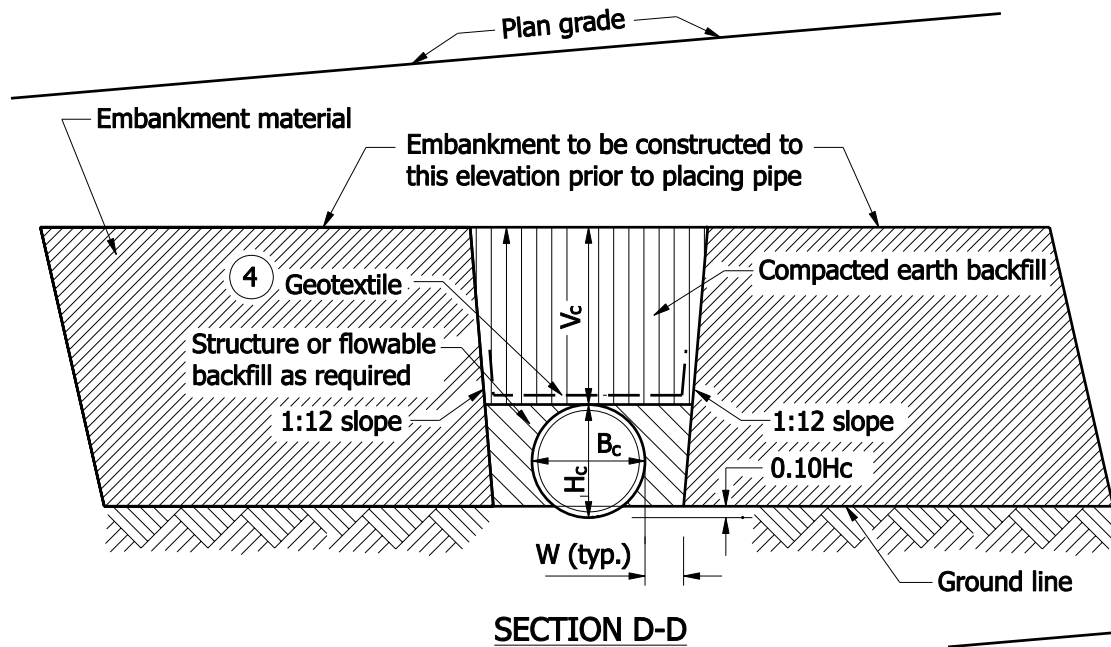
NOTES :

- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 0.5 m for $B_c \leq 450$
 - 0.9 m for $18" < B_c \leq 1350$
 - 1.2 m for $B_c > 1350$
- For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
- Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 0.6 m. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 0.6 m encasement.
- Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench or toe of slope.

All Dimensions are in mm unless otherwise specified.

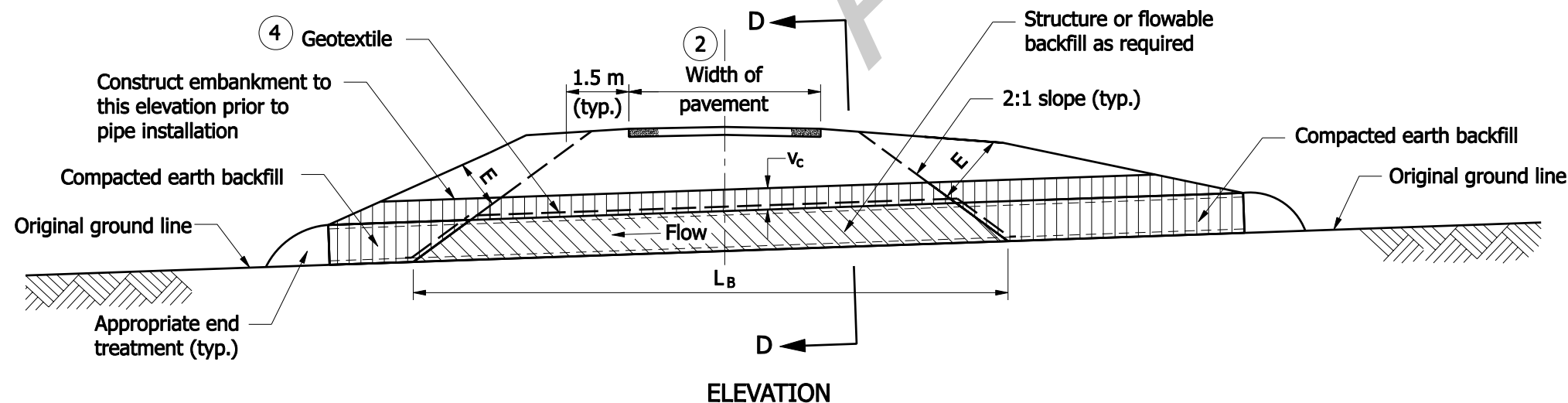
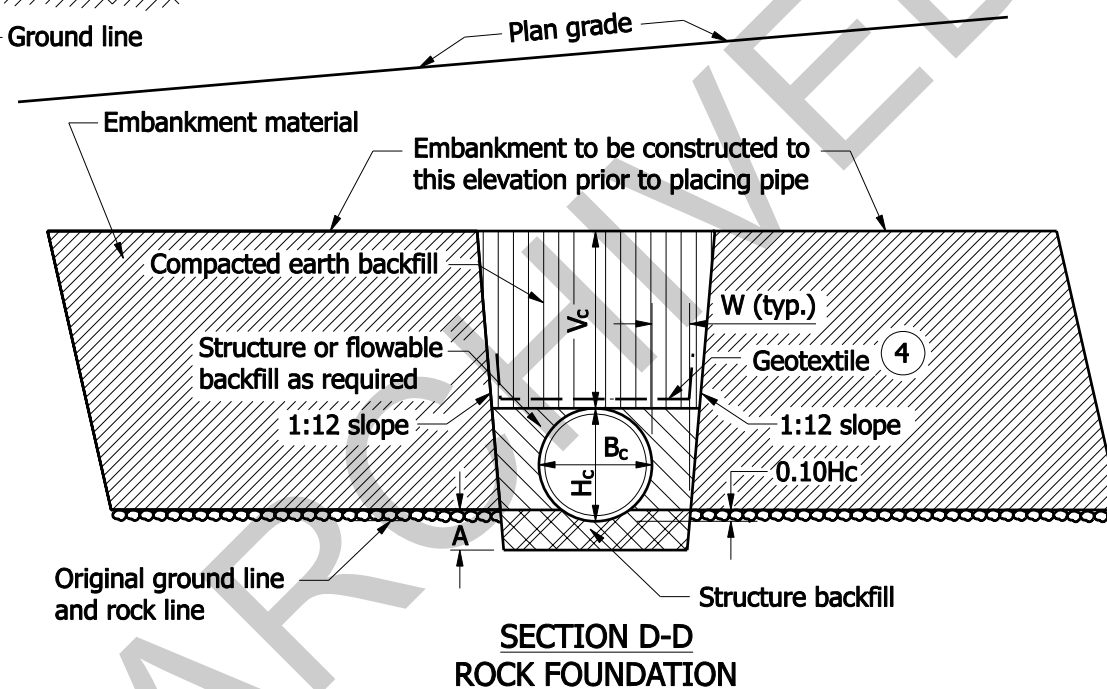
INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 2
CLASS II, IV, V AND VI DRIVES, TRENCH



LEGEND

H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 200 min. for fill height less than 5.0 m
 = 300 min. for fill height of 5.0 m or more
 V_c = 300 for $B_c \leq 450$
 450 for $B_c > 450$
 W = $0.3 B_c$ or 230, whichever is greater
 E = Encasement
 L_B = Backfill length measured from toe to toe of the 2:1 slopes.



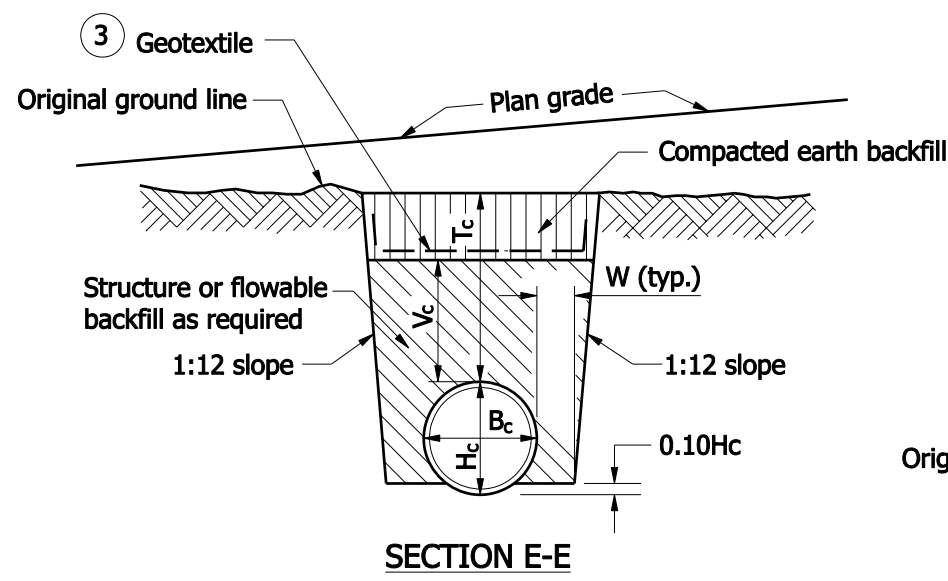
NOTES :

- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 0.5 m for $B_c \leq 450$
 - 0.9 m for $18" < B_c \leq 1350$
 - 1.2 m for $B_c > 1350$
- For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
- Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 0.6 m. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 0.6 m encasement.
- Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench or toe of slope.

All Dimensions are in mm unless otherwise specified.

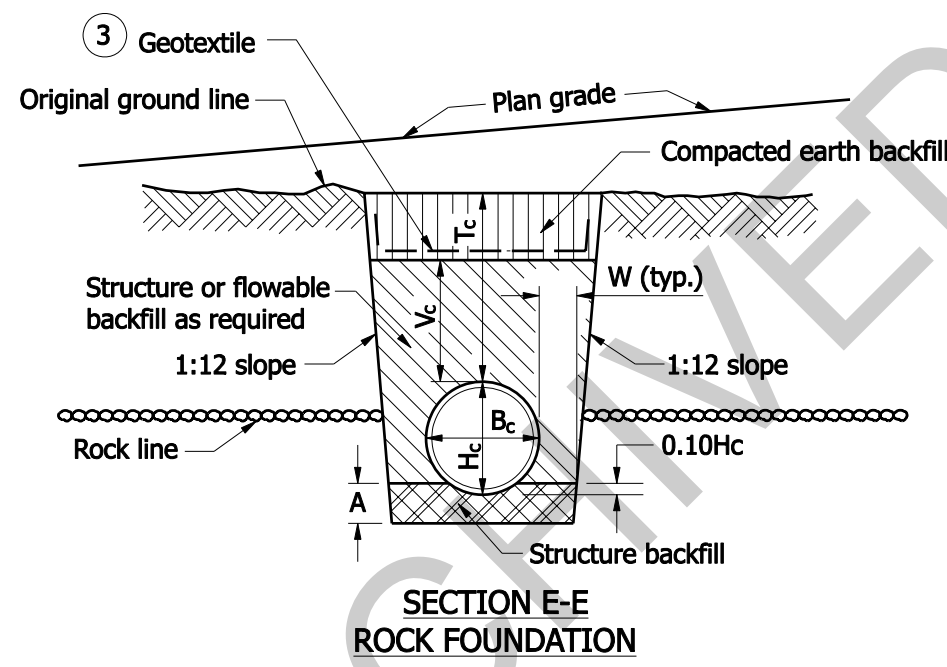
INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 2
CLASS II, IV, V AND VI DRIVES, EMBANKMENT



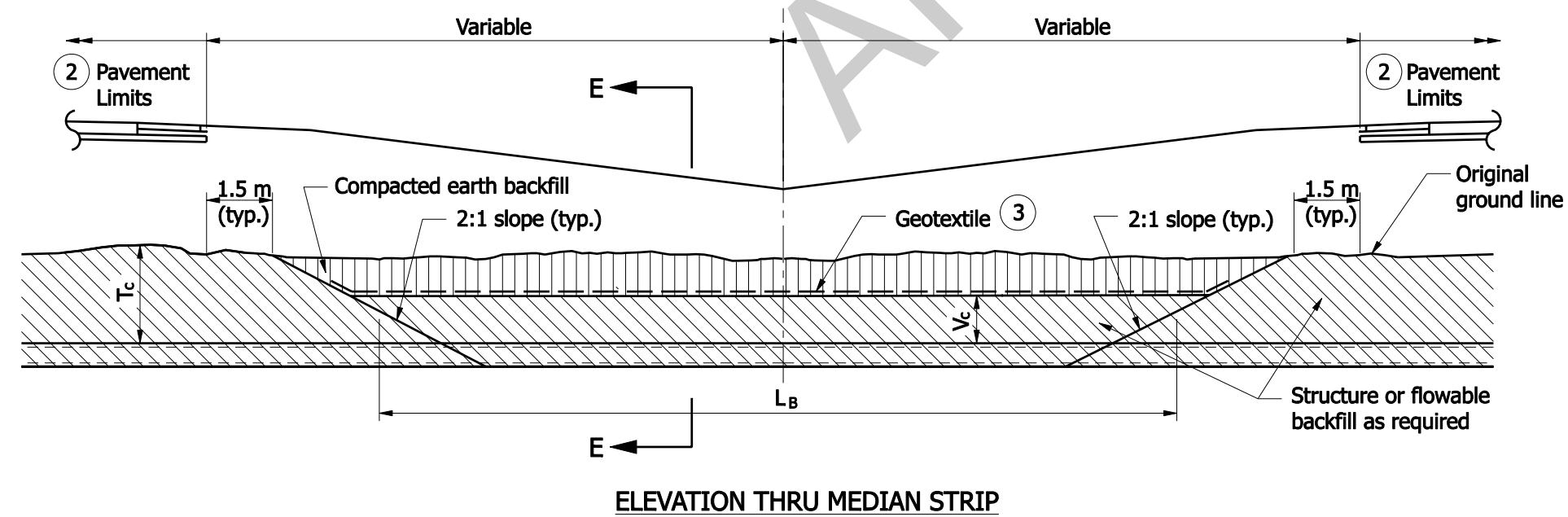
LEGEND

- H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 200 min. for fill height less than 5.0 m
= 300 min. for fill height of 5.0 m or more
 V_c = 300 for $B_c \leq 450$
450 for $B_c > 450$
 T_c = Trench cover depth over pipe
 W = $0.3 B_c$ or 230, whichever is greater
 L_B = Backfill length measured from toe to toe of the 2:1 slopes.



NOTES :

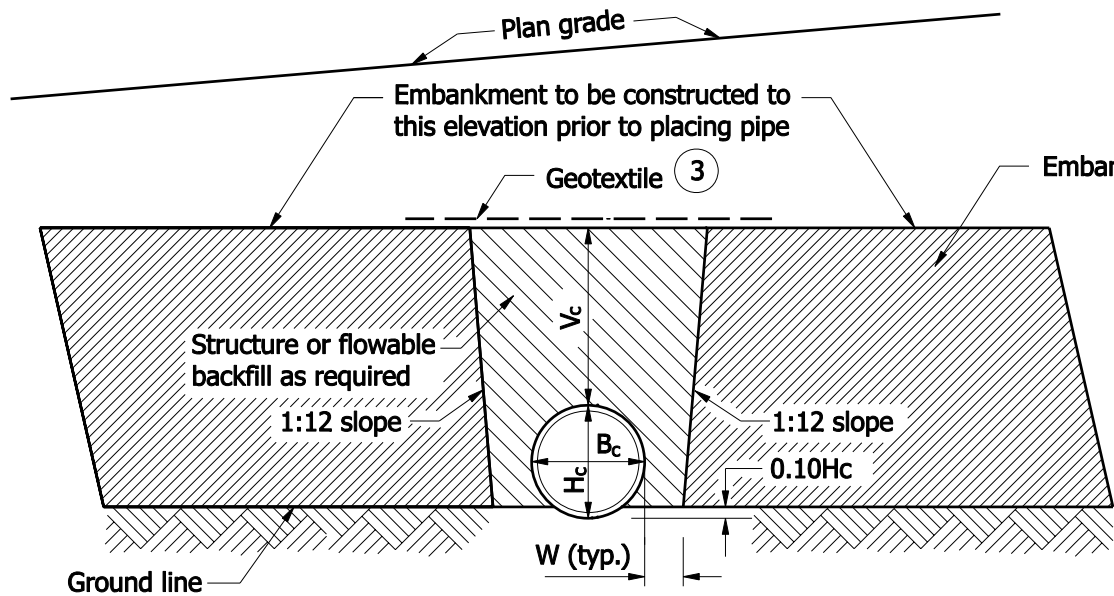
1. Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - a.) 0.5 m for $B_c \leq 450$
 - b.) 0.9 m for $18" < B_c \leq 1350$
 - c.) 1.2 m for $B_c > 1350$
2. For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
3. Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench or toe of slope.



All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

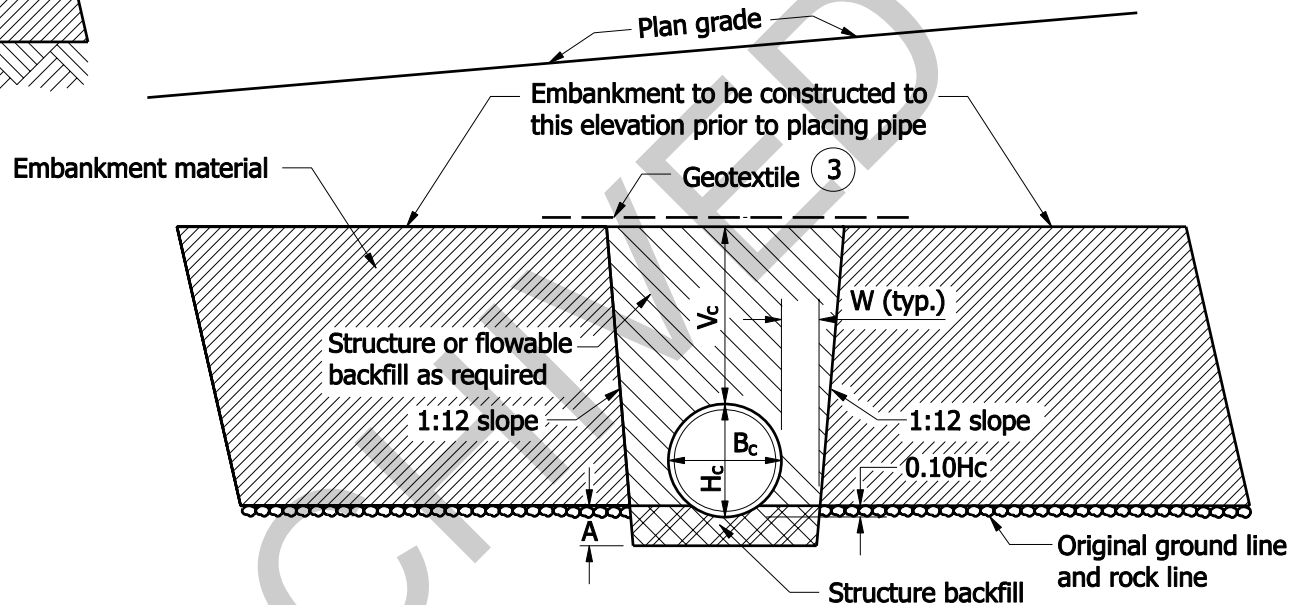
PIPE BACKFILL METHOD 3
MEDIAN INSTALLATION, TRENCH



SECTION F-F

LEGEND

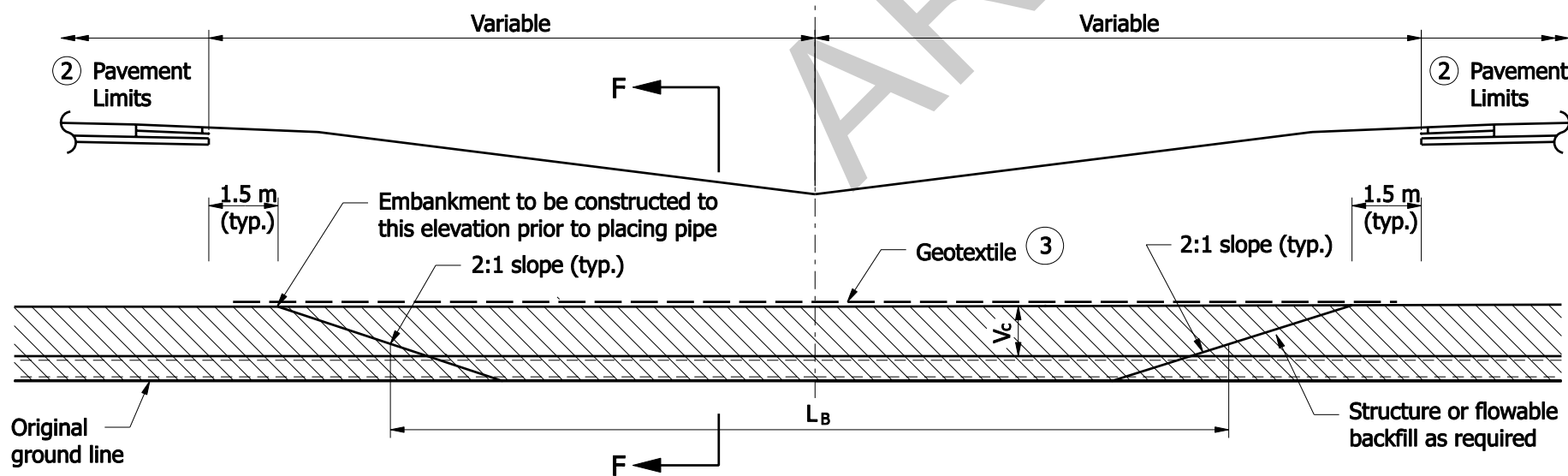
- H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 200 min. for fill height less than 5.0 m
 = 300 min. for fill height of 5.0 m or more
 V_c = 300 for $B_c \leq 450$
 450 for $B_c > 450$
 W = $0.3 B_c$ or 230, whichever is greater
 L_B = Backfill length measured from toe to toe of the 2:1 slopes.



SECTION F-F
ROCK FOUNDATION

NOTES :

1. Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - a.) 0.5 m for $B_c \leq 450$
 - b.) 0.9 m for $18" < B_c \leq 1350$
 - c.) 1.2 m for $B_c > 1350$
2. For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
3. Geotextile required if coarse aggregate is used. Geotextile should extend 300 beyond each edge of the excavated trench or toe of slope.

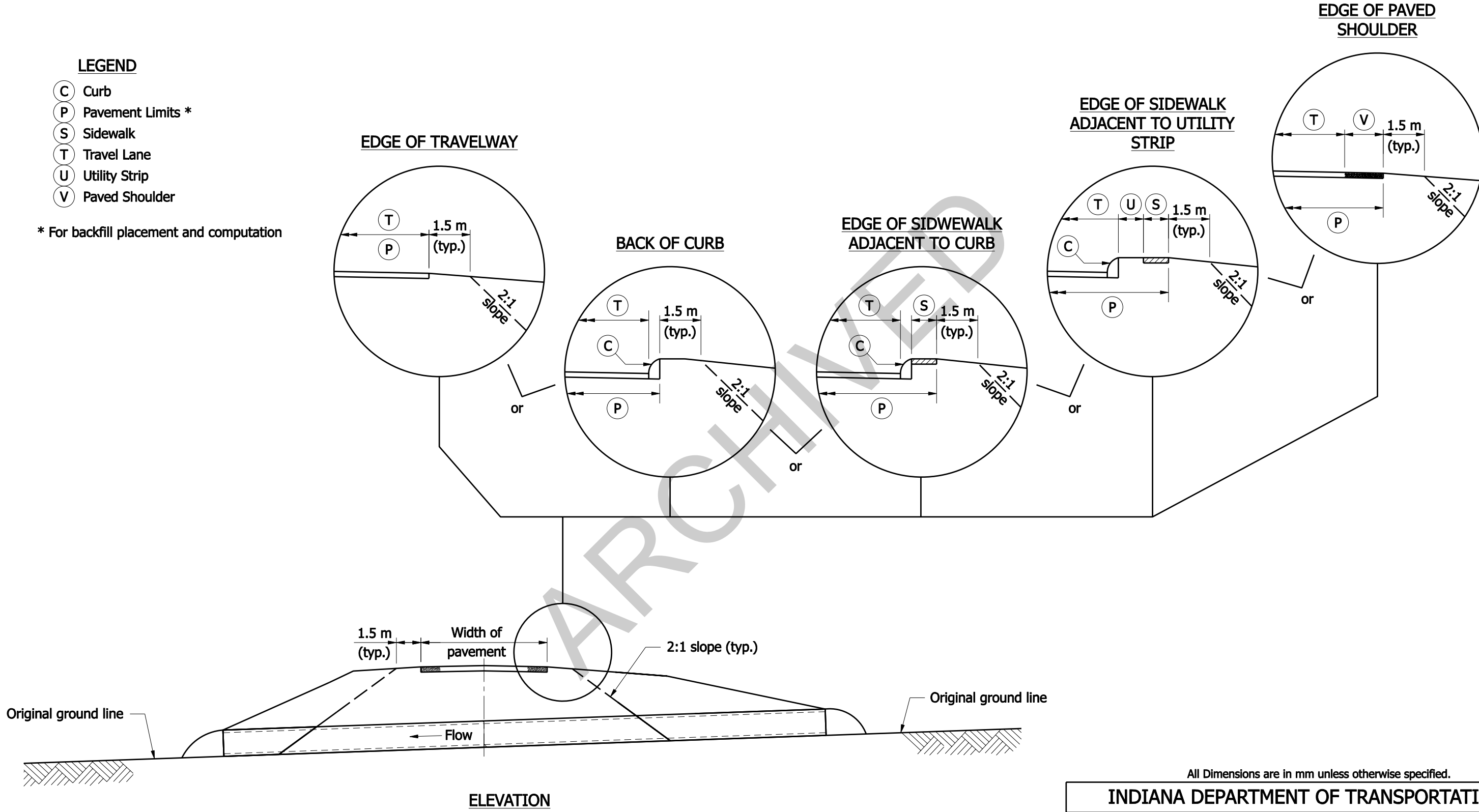


ELEVATION THRU MEDIAN STRIP

All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 1
MEDIAN INSTALLATION, EMBANKMENT



All Dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL
LIMIT DETERMINATION