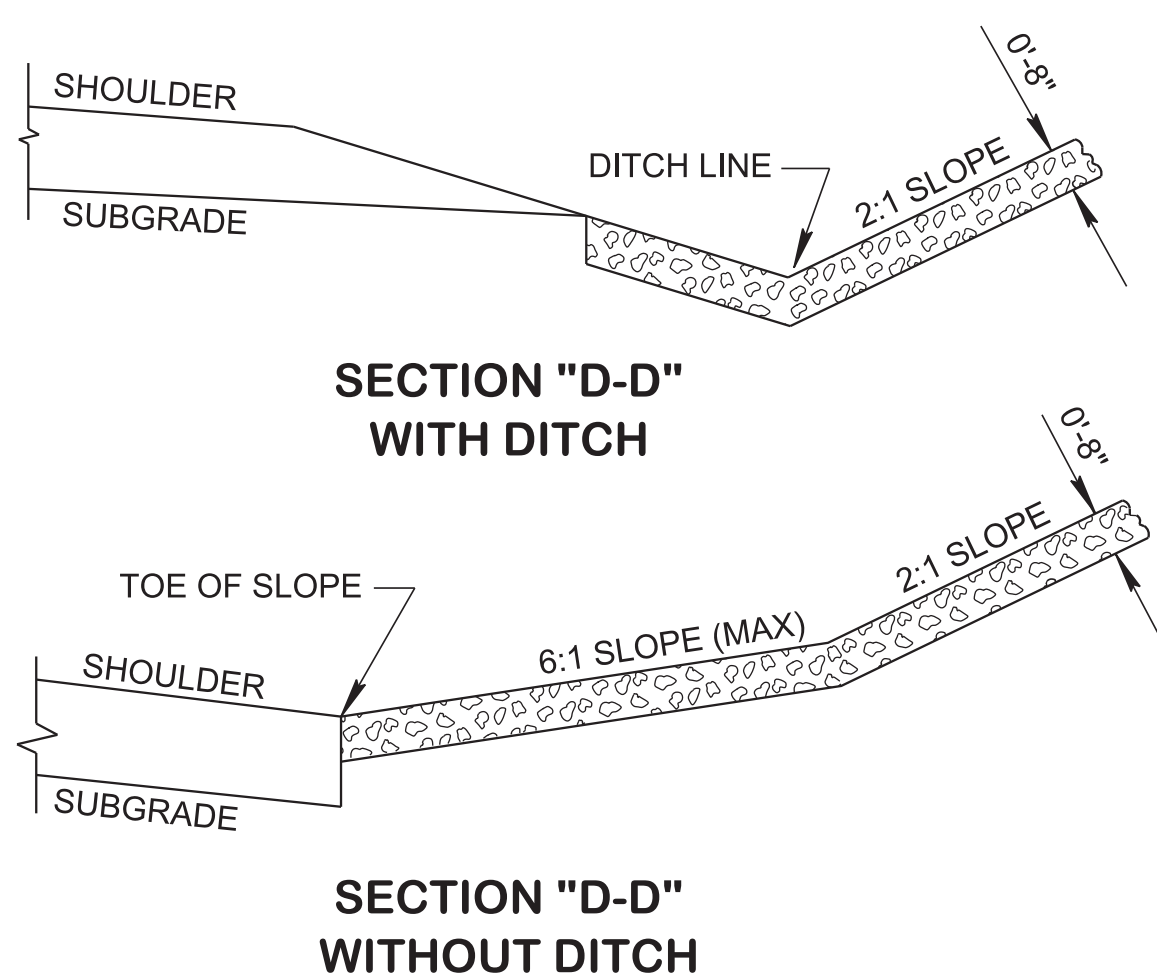
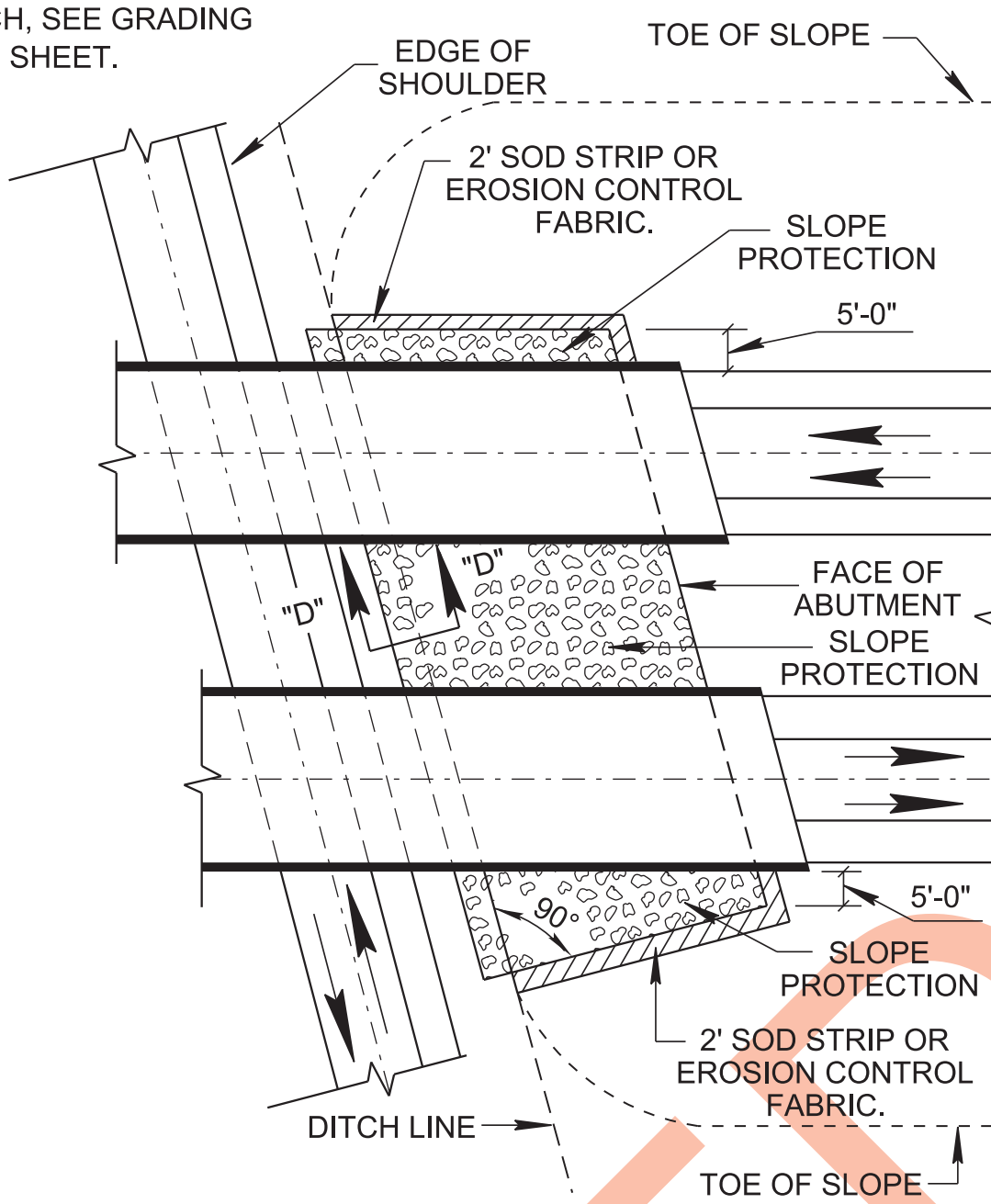
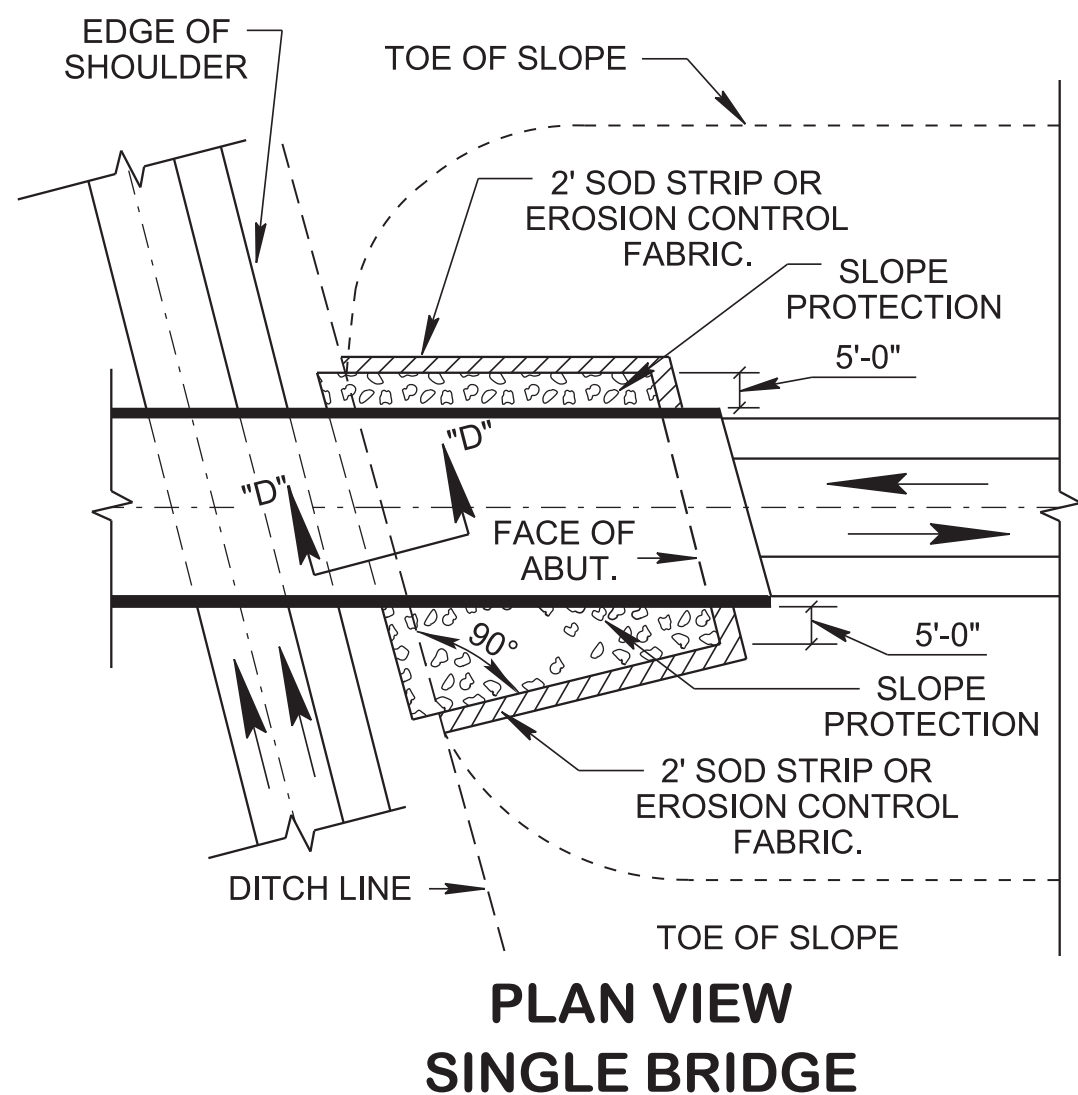


RIP-RAP DETAILS



NOTE: PLAN VIEWS ARE SHOWN WITH DITCH. FOR VIEW WITHOUT DITCH, SEE GRADING DESIGN LAYOUT ON THIS SHEET.

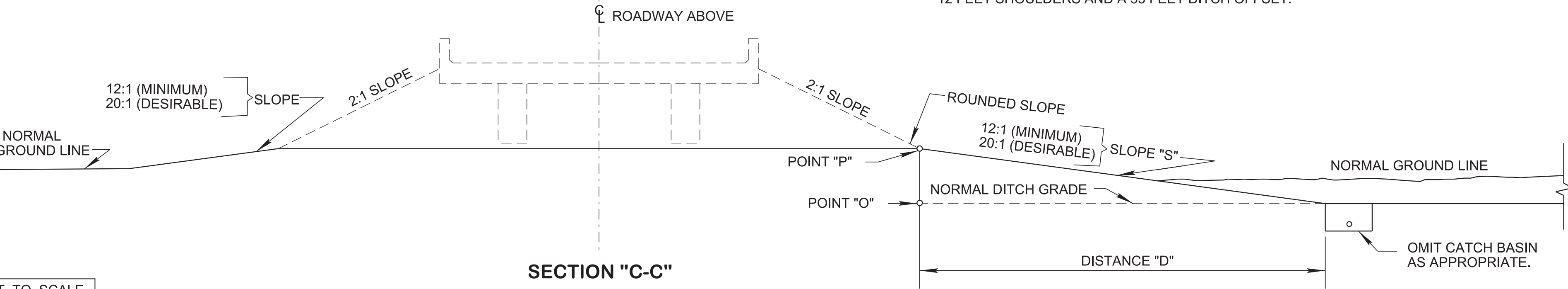
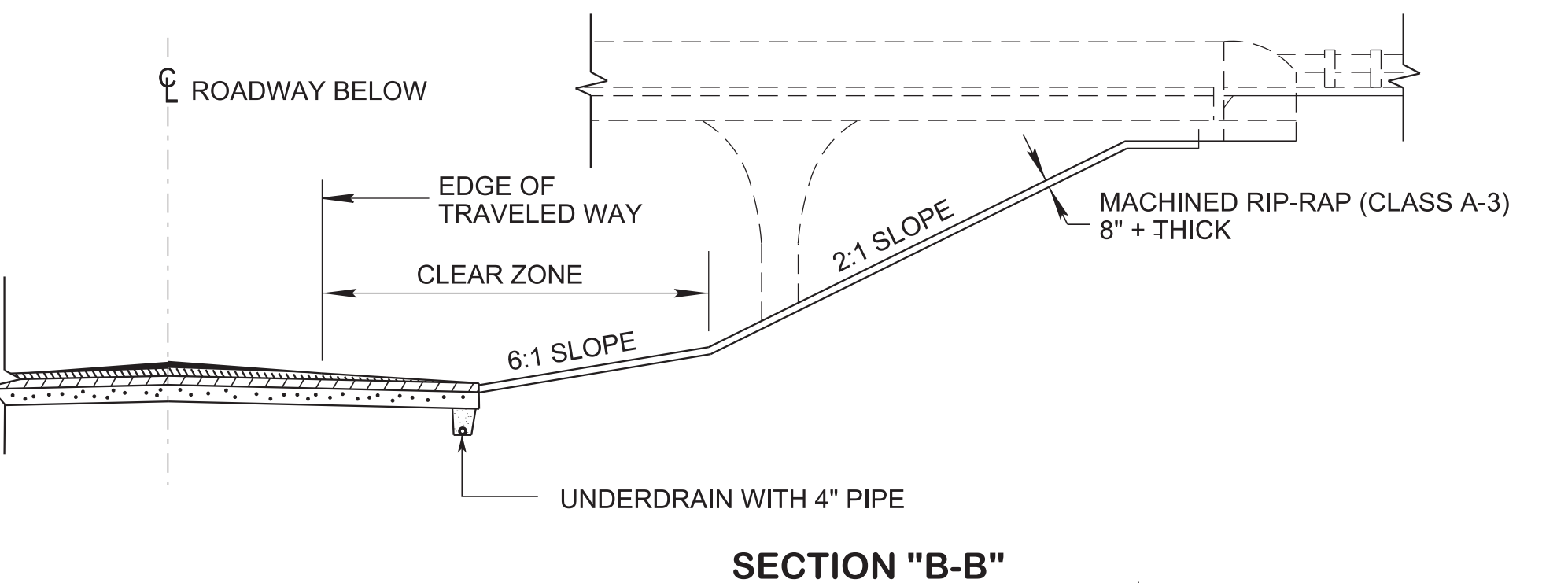
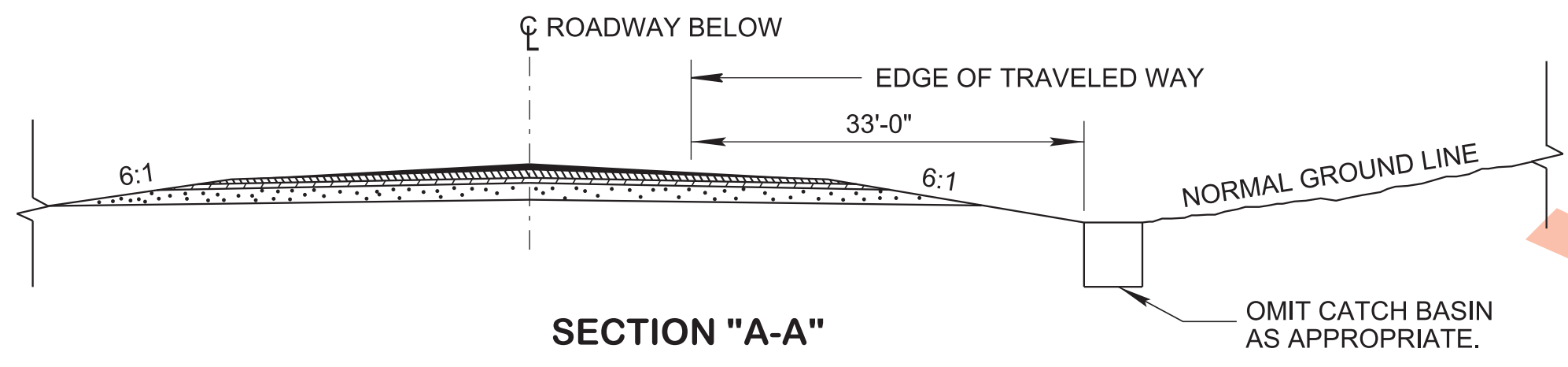


DESIGN NOTES

- (A) ALL WORK INDICATED ON THIS DRAWING SHALL BE PERFORMED IN ACCORDANCE WITH THE
- (B) PAYMENT FOR ALL ITEMS DIRECTLY INDICATED OR IMPLIED ON THIS DRAWING WILL BE MADE UNDER APPROPRIATE ITEM NUMBER(S) AND DESCRIPTION(S) RECORDED ELSEWHERE IN THE PLANS.
- NOTES TO DESIGNERS:**
- (C) WHEN EXISTING PHYSICAL CONDITIONS OF THE APPROACH AND TRANSITION ZONE ARE SO UNIQUE AS TO WARRANT INDIVIDUAL DESIGN, A CONTOUR PLAN SHALL BE PREPARED TO PROVIDE THE CONSTRUCTION ENGINEER WITH DATA FOR CONSTRUCTION TO THE INTENDED LINES AND GRADES.
- (D) IN RARE CASES WHEN A STEEP (GREATER THAN 3:1) FILL SLOPE IS UNAVOIDABLE WITHIN THE SAFETY APPROACH ZONE, A BARRIER WILL BE INDICATED ON PLANS IN ACCORDANCE WITH DESIGN POLICY SET OUT IN THE "S-GR-" SERIES OF STANDARD DRAWINGS.

MACHINED RIP-RAP SLOPE PROTECTION NOTES

- 1 MACHINED RIP-RAP FOR SLOPE PROTECTION SHALL BE TWO (2) INCHES TO SIX (6) INCHES IN SIZE, UNIFORMLY GRADED AND MEET THE REQUIREMENTS OF SUBSECTION 709 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. IT IS TO BE PAID FOR UNDER ITEM NO. 709-05.05, MACHINED RIP-RAP (CLASS A-3) PER TON.
- 2 AGGREGATE SHALL BE PLACED TO A DEPTH OF EIGHT (8) INCHES MEASURED PERPENDICULAR TO THE SLOPE FLUSH WITH THE EMBANKMENT SLOPE UNDER THE BRIDGE, SHALL EXTEND FROM THE FACE OF THE ABUTMENTS OR END BENTS ACROSS THE BERM AND DOWN THE SLOPE TO A POINT AS SHOWN IN SECTION "D-D" ABOVE, AND SHALL EXTEND LATERALLY TO FIVE (5) FEET BEYOND THE OUTER EDGES OF THE SUPERSTRUCTURE.
- 3 THE CRUSHED AGGREGATE MAY BE DUMPED IN PLACE. PLACING SHALL BE CONDUCTED IN A MANNER TO PRODUCE A UNIFORM SURFACE VARYING NO MORE THAN TWO (2) INCHES IN FOUR (4) FEET FROM A TRUE PLANE. HAND PLACINGS MAY BE REQUIRED AS NECESSARY TO CORRECT IRREGULARITIES EXCEEDING THE SPECIFIED TOLERANCES.
- 4 WHERE THE MEDIAN IS OVER 60 FEET, THE SLOPE PROTECTION SHALL EXTEND TO THE WIDTH REQUIRED FOR EACH SEPARATE STRUCTURE AND THE AREA BETWEEN THE SLOPE PROTECTION OF EACH STRUCTURE SHALL BE SODDED.
- 5 WHERE THE MEDIAN IS 60 FEET OR LESS, THE SLOPE PROTECTION SHALL EXTEND AS SHOWN IN THE PLAN VIEW ABOVE.

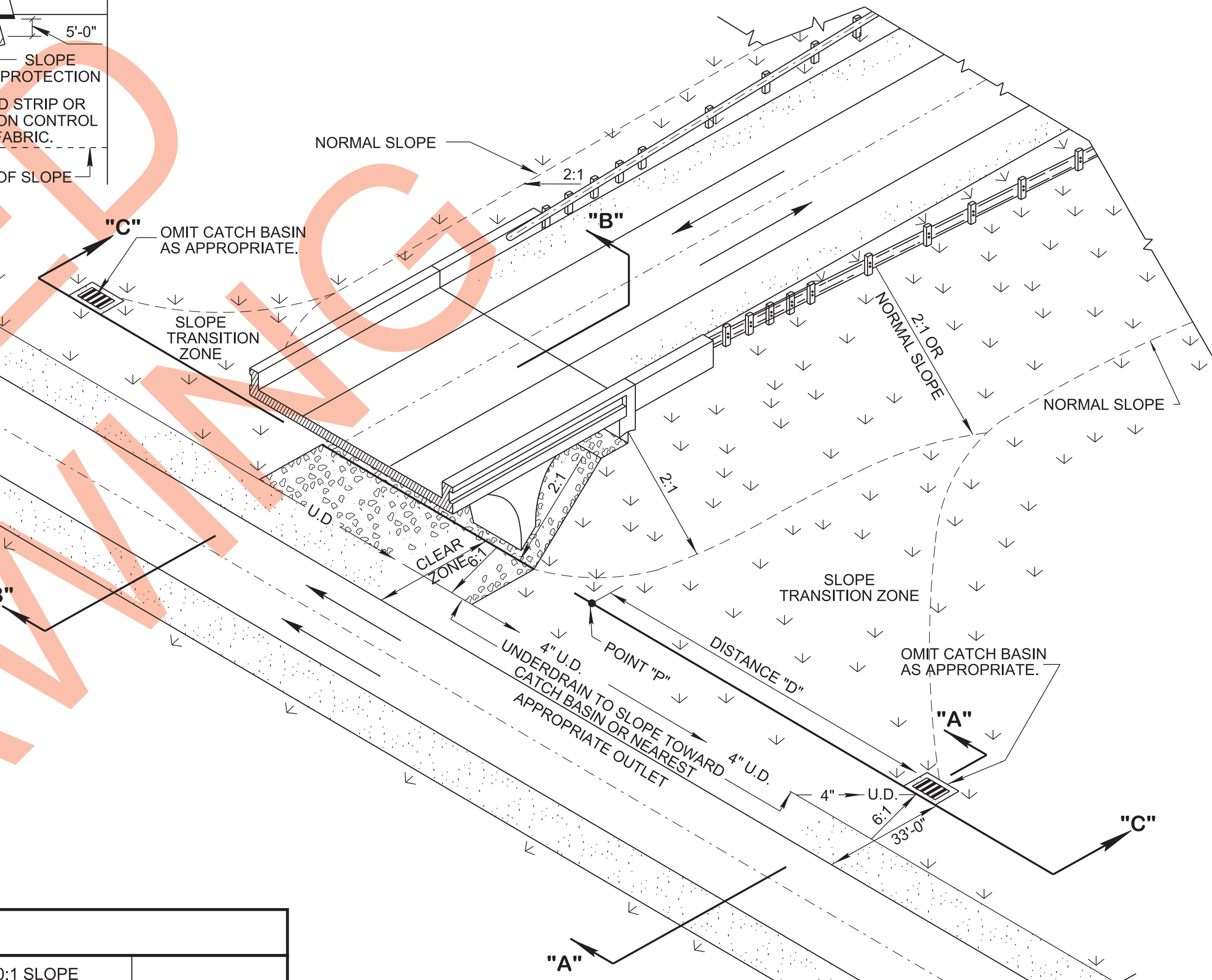
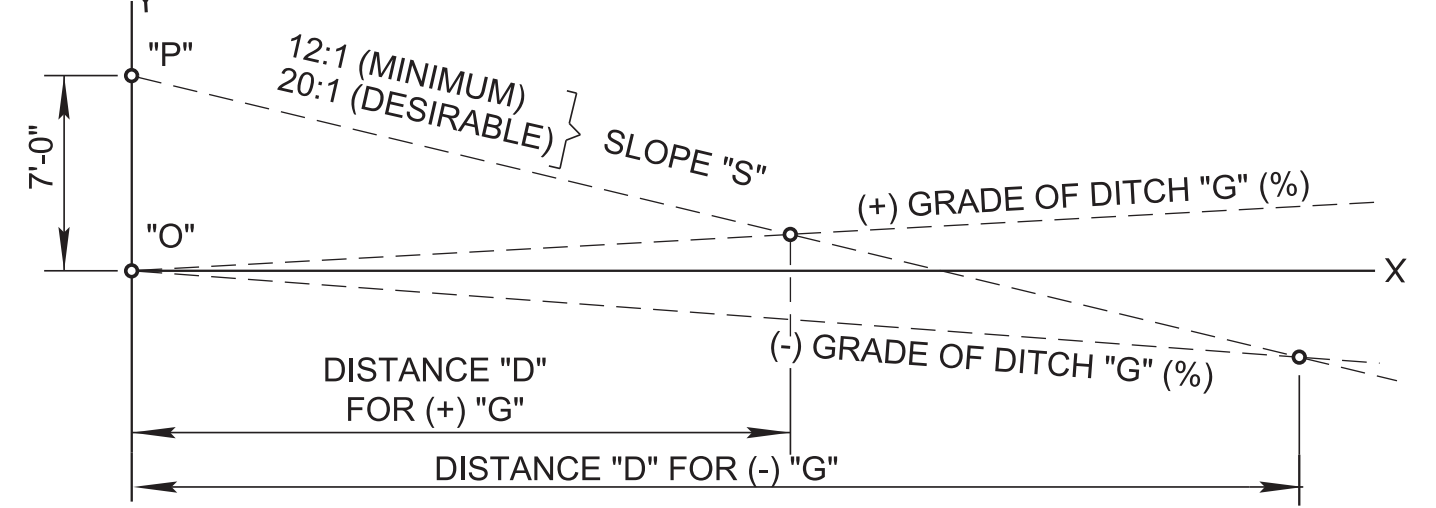


FORMULAS

GENERAL	12:1 SLOPE	20:1 SLOPE	
"D" = $\frac{700 \times "S"}{100 + ("S" \times "G")}$	"D" = $\frac{840}{10 + 1.2"G"}$	"D" = $\frac{1400}{10 + 2"G"}$	FOR (+) GRADE
"D" = $\frac{700 \times "S"}{100 - ("S" \times "G")}$	"D" = $\frac{840}{10 - 1.2"G"}$	"D" = $\frac{1400}{10 - 2"G"}$	FOR (-) GRADE

FORMULAS ARE BASED ON A ROADWAY WITH, 12 FEET SHOULDERS AND A 33 FEET DITCH OFFSET.

NOTE: THE SKETCH BELOW ASSUMES A 0.0% GRADE ON THE ROADWAY APPROACHING THE HAZARD (BRIDGE PIER), TO COMPENSATE FOR VARIABLE GRADES, SOLVE FOR "D" ACCORDING TO THE FOLLOWING SKETCH AND FORMULAS.



STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

SAFETY APPROACH TO UNDERPASSES GRADING DESIGN AND SLOPE PROTECTION

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NOT TO SCALE