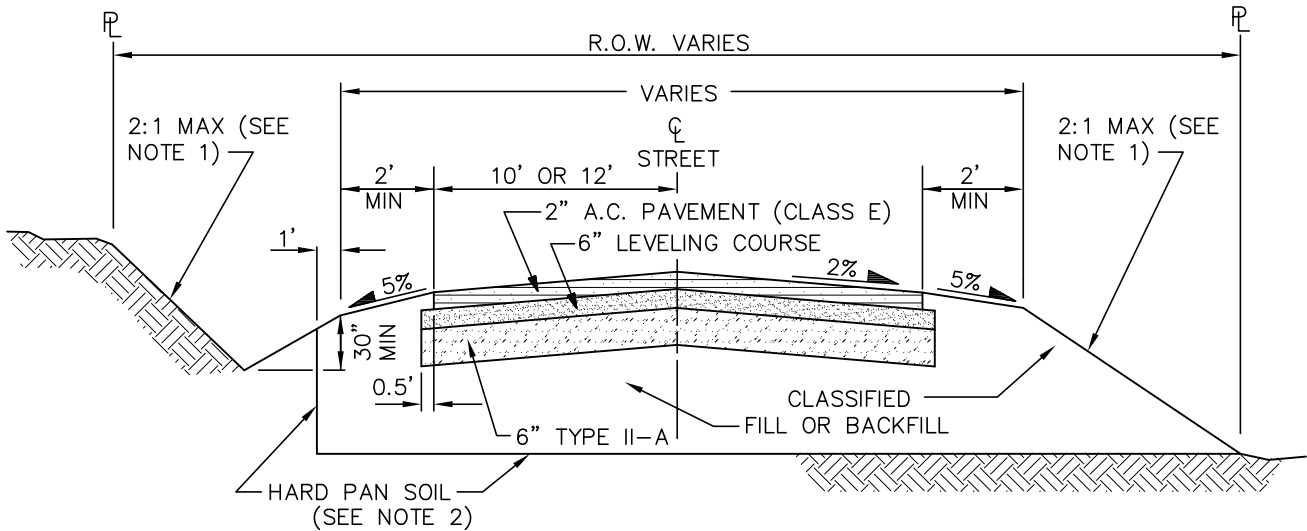
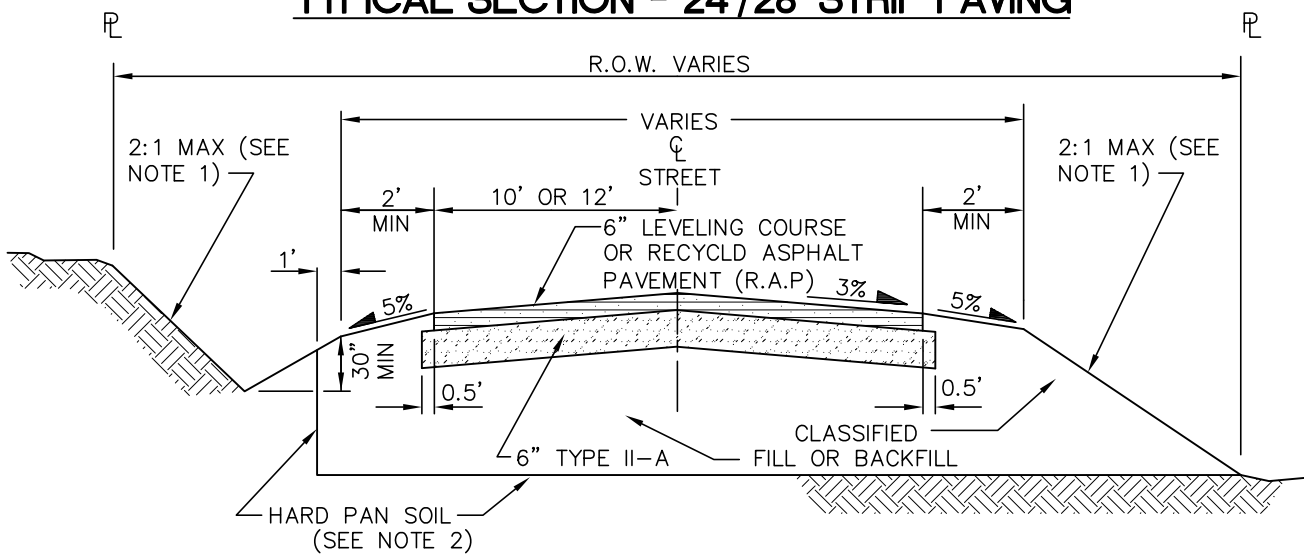


**STANDARD CONSTRUCTION SPECIFICATIONS
MISCELLANEOUS
DIVISION 20
INDEX OF STANDARD DETAILS**

20-1	Typical Sections - 20'/24' Strip Paved and R.A.P./Gravel Streets
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20-5	Typical Section - Alley
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20-8	Trench Backfill and Bedding Layout
20-9	Pipe Insulation
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20-11	Class "C" Bedding Material
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TYPICAL SECTION - 24'/28' STRIP PAVING



TYPICAL SECTION - 24'/28' R.A.P./GRAVEL STREET

NOTES:

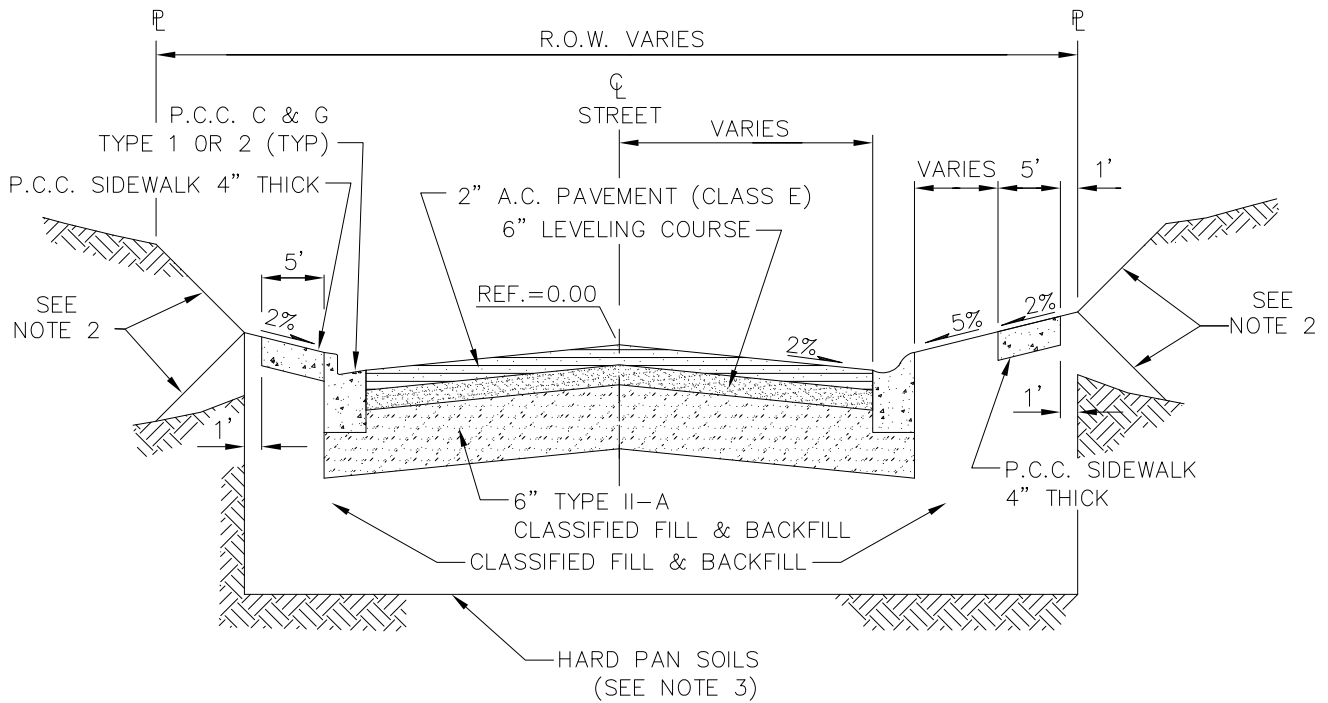
1. PLACE OR REMOVE AND GRADE MATERIAL IN A NEAT MANNER FROM EXCAVATION LIMITS TO EXISTING ELEVATION AT PROPERTY LINE OR AS DIRECTED BY THE ENGINEER. (MAXIMUM 2:1 CUT AND FILL SLOPES)
2. ENGINEER WILL DETERMINE THE DEPTH OF EXCAVATION.
3. UNLESS OTHERWISE APPROVED, THE CENTERLINE OF STREET SHALL BE THE CENTERLINE OF R.O.W.



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**TYPICAL SECTIONS
24'/28' STRIP PAVED AND
R.A.P./GRAVEL STREETS**

SECTION #
DIV 20
DETAIL #
20-1



NOTES:

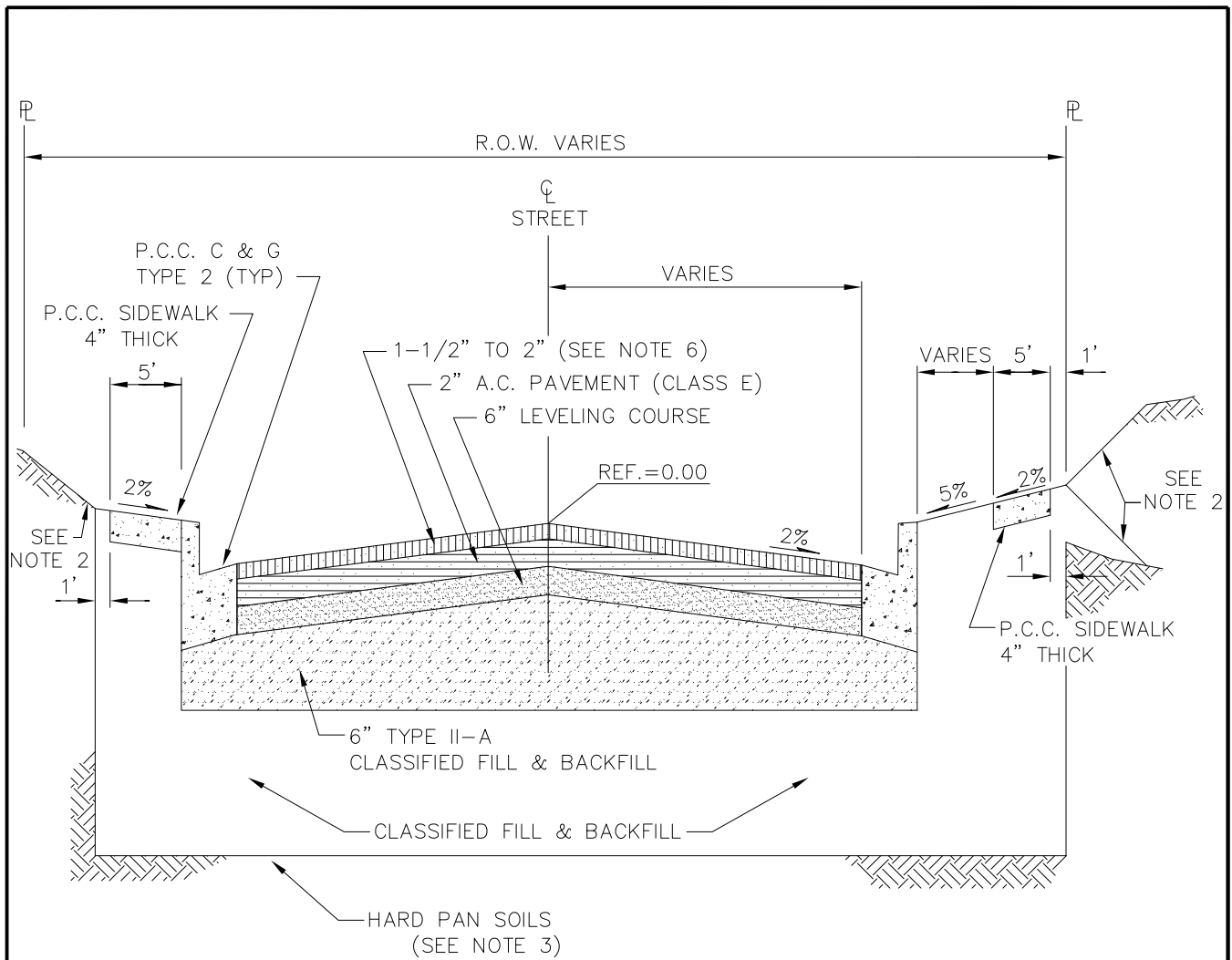
1. DIMENSIONS AND ELEVATIONS SHOWN ON THIS STANDARD DETAIL ARE TYPICAL. PROJECT SPECIFIC DIMENSIONS SHOWN ON THE DRAWINGS SHALL CONTROL.
2. PLACE OR REMOVE AND GRADE MATERIAL IN A NEAT MANNER FROM EXCAVATION LIMITS TO EXISTING ELEVATION AT PROPERTY LINE OR AS DIRECTED BY THE ENGINEER. (MAXIMUM 2:1 CUT AND FILL SLOPES)
3. ENGINEER WILL DETERMINE THE DEPTH OF EXCAVATION.
4. UNLESS OTHERWISE APPROVED, THE CENTERLINE OF STREET SHALL BE THE CENTERLINE OF R.O.W.
5. WHERE SIDEWALKS ARE NOT CONSTRUCTED, SEE STANDARD DETAIL 20-4 FOR SLOPING BETWEEN CURB AND PROPERTY LINE.



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TYPICAL SECTIONS SECONDARY STREETS

SECTION #
DIV 20
DETAIL #
20-2



NOTES:

1. DIMENSIONS AND ELEVATIONS SHOWN ON THIS DRAWING ARE TYPICAL. PROJECT SPECIFIC DIMENSIONS SHOWN ON THE DRAWINGS CONTROL.
2. PLACE OR REMOVE AND GRADE MATERIAL IN A NEAT MANNER FROM EXCAVATION LIMITS TO EXISTING ELEVATION AT PROPERTY LINE OR AS DIRECTED BY THE ENGINEER (MAXIMUM-2:1 CUT AND FILL SLOPES).
3. ENGINEER WILL DETERMINE THE DEPTH OF EXCAVATION.
4. UNLESS OTHERWISE APPROVED, THE CENTERLINE OF STREET SHALL BE THE CENTERLINE OF R.O.W.
5. WHERE SIDEWALKS ARE NOT CONSTRUCTED, SEE STANDARD DETAIL 20-4 FOR SLOPING BETWEEN CURB AND PROPERTY LINE.
6. A.C. PAVEMENT DEPTH SHALL BE 1-1/2" FOR CLASS D PAVEMENT AND 2" FOR CLASS A PAVEMENT.

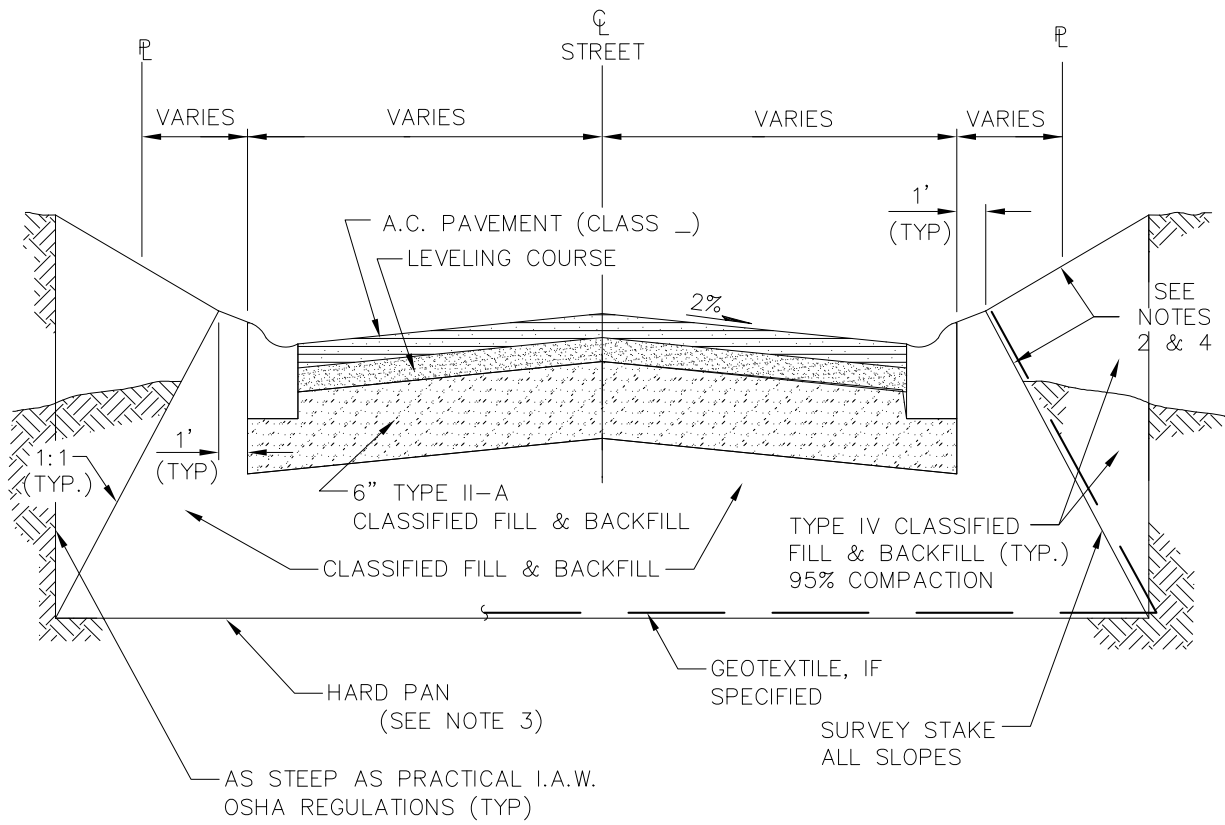
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TYPICAL SECTIONS PRIMARY STREETS

SECTION #
DIV 20
DETAIL #
20-3



NOTES:

1. DIMENSIONS AND ELEVATIONS SHOWN ON THIS DRAWING ARE TYPICAL. PROJECT SPECIFIC DIMENSIONS SHOWN ON THE DRAWINGS SHALL CONTROL.
2. PLACE OR REMOVE AND GRADE MATERIAL IN A NEAT MANNER FROM EXCAVATION LIMITS TO EXISTING ELEVATION AT PROPERTY LINE OR AS DIRECTED BY THE ENGINEER. (MAXIMUM 2:1 CUT AND FILL SLOPES)
3. ENGINEER WILL DETERMINE THE DEPTH OF EXCAVATION.
4. SEE APPLICABLE STANDARD DETAIL FOR SPECIFIC STREET DIMENSIONS.

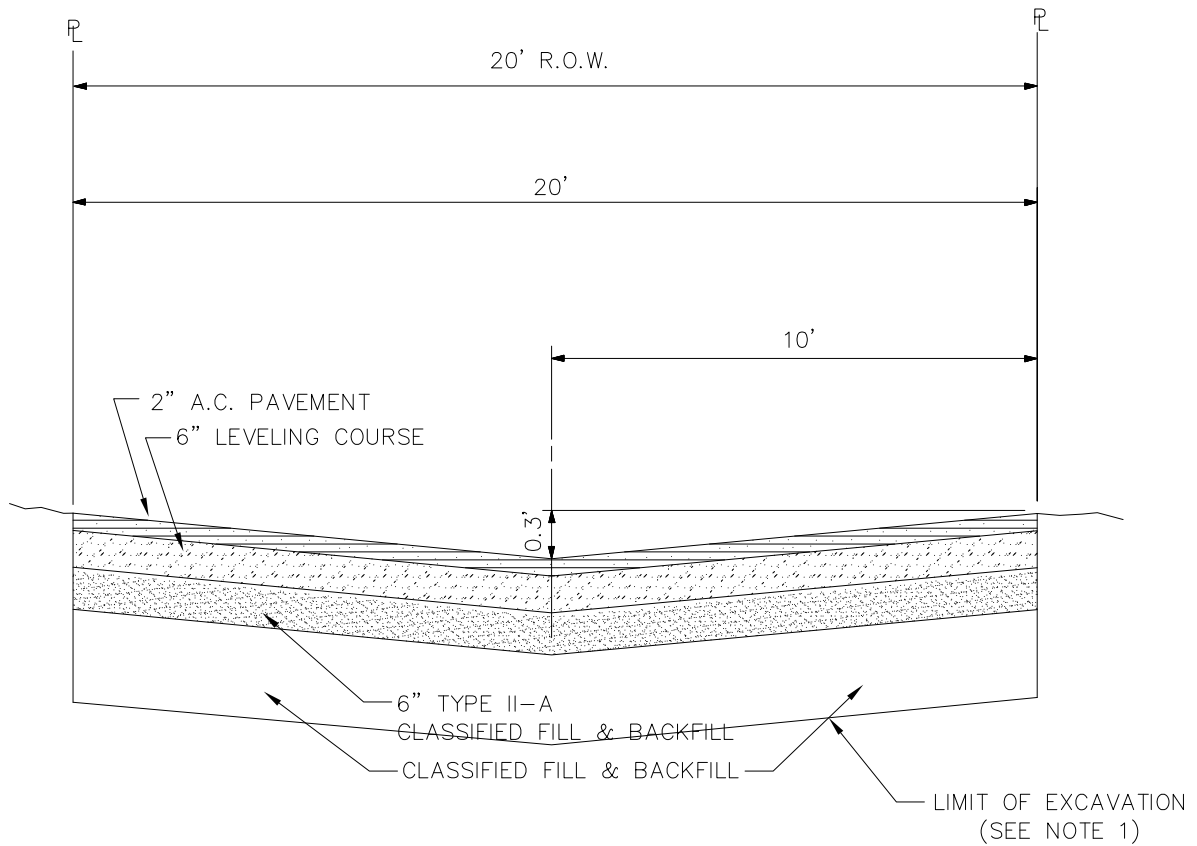
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TYPICAL SECTIONS DEEP EXCAVATION

SECTION #
DIV 20
DETAIL #
20-4



NOTES:

1. ENGINEER WILL DETERMINE THE DEPTH OF EXCAVATION.

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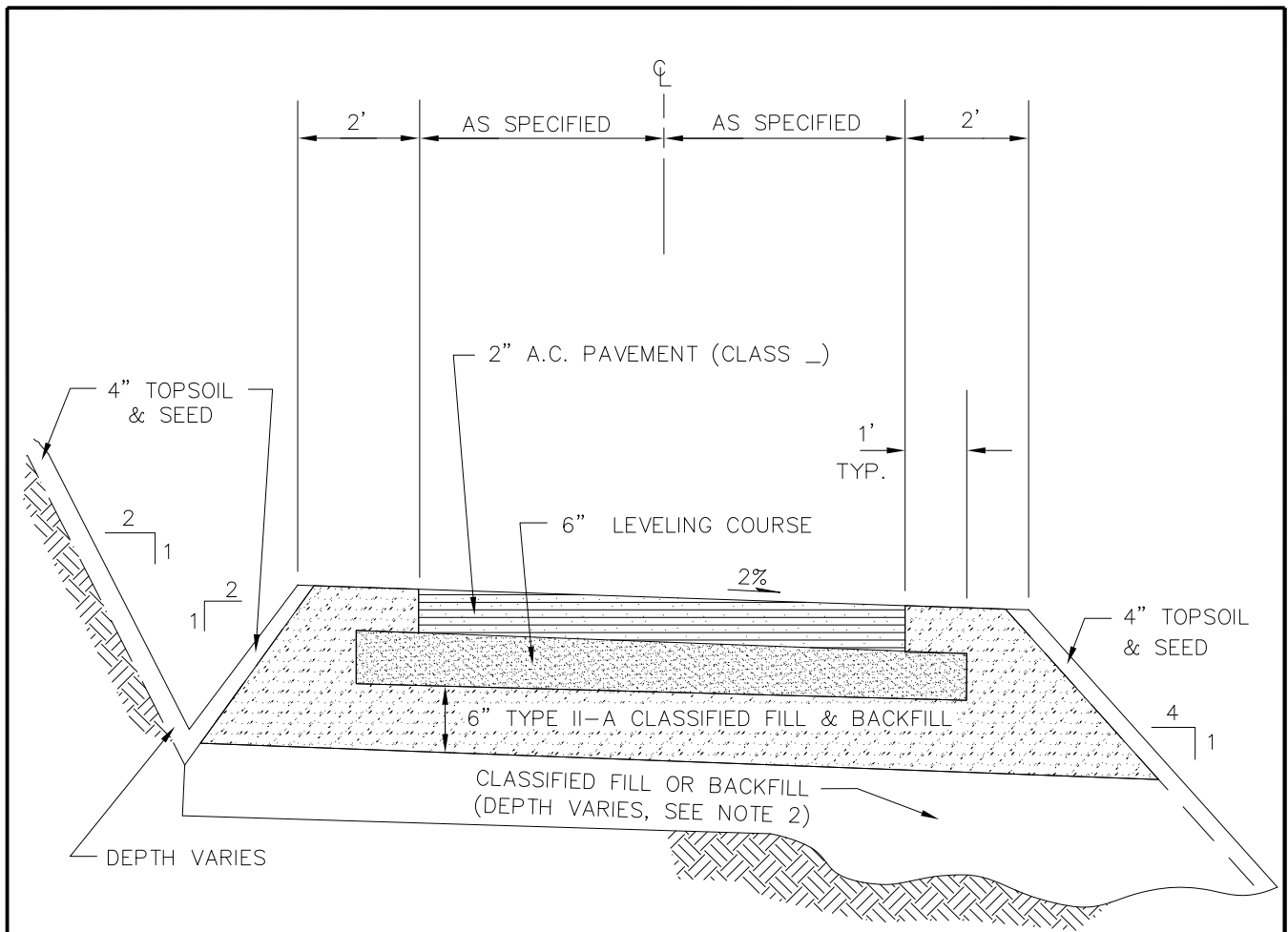
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TYPICAL SECTION ALLEY

SECTION #
DIV 20

DETAIL #
20-5



NOTES:

1. DIMENSIONS AND ELEVATIONS SHOWN ON THIS STANDARD DETAIL ARE TYPICAL. PROJECT SPECIFIC DIMENSIONS SHOWN ON THE DRAWINGS SHALL CONTROL.
2. ENGINEER WILL DETERMINE THE DEPTH OF EXCAVATION.
3. ADJUST DEPTH OF DITCH AS NECESSARY FOR POSITIVE DRAINAGE AS SHOWN IN THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
4. PLACE CROSS CULVERTS AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER

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SCALE:
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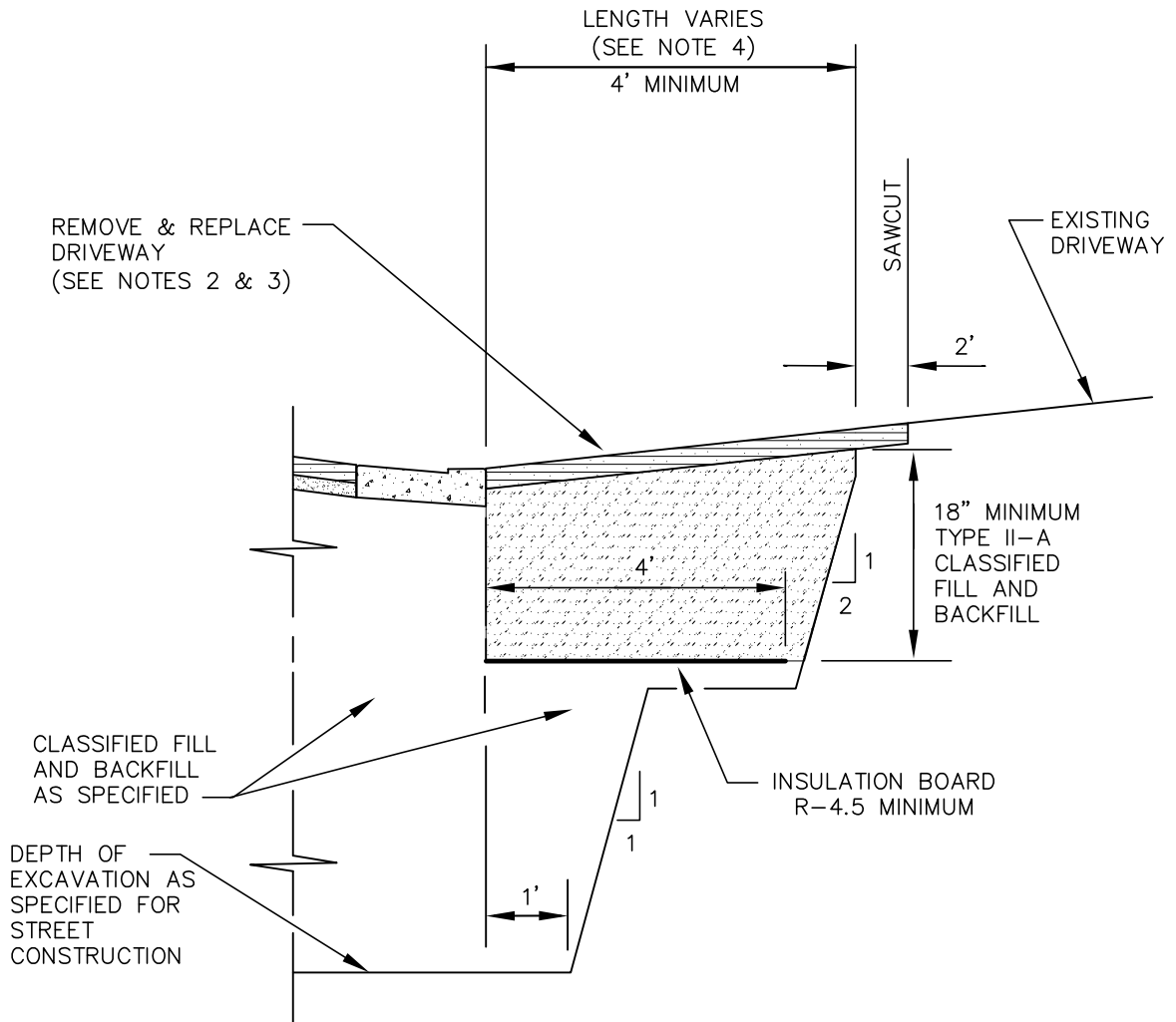
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TYPICAL SECTIONS PATHWAY

SECTION #
DIV 20

DETAIL #
20-6



NOTES:

1. SURFACING SHALL MATCH EXISTING DRIVEWAY.
2. ASPHALT PAVEMENT SHALL CONSIST OF 6" LEVELING COURSE AND 2" AC PAVEMENT (CLASS E). APPLY TACK COAT AT SAWCUT AND BACK OF CURB.
3. CONCRETE PAVEMENT SHALL CONSIST OF 6" P.C.C. WITH BROOM FINISH PARALLEL TO CURB AND GUTTER. PROVIDE EXPANSION JOINT AT CURB.
4. LENGTH OF DRIVEWAY REMOVED AND REPLACED VARIES AS SHOWN IN THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.



SCALE:
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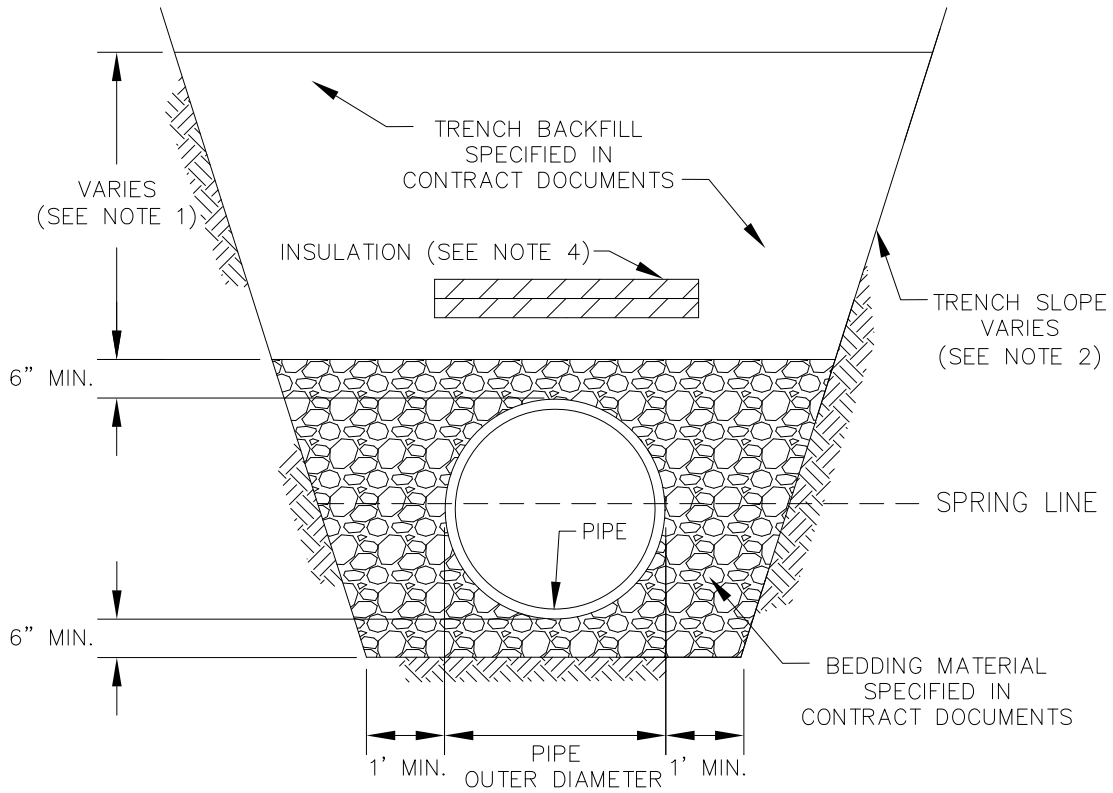
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DRIVEWAY CONNECTION DETAIL

SECTION #
DIV 20

DETAIL #
20-7



NOTES:

1. TRENCH BACKFILL MATERIAL PLACED AND COMPACTED TO DEPTHS SHOWN IN THE DRAWINGS OR AS DETERMINED BY ENGINEER. COMPACT TRENCH BACKFILL TO A MINIMUM OF 95% MAXIMUM DENSITY.
2. TRENCH WALL SLOPES WILL VARY WITH SOIL STRENGTH AND CHARACTER. SLOPES SHALL CONFORM TO OSHA SAFETY STANDARDS.
3. BACKFILL SHALL BE FREE OF CLAYS AND ORGANIC MATERIALS.
4. WHEN SPECIFIED IN CONTRACT DOCUMENTS, SEE STANDARD DETAIL 20-9 FOR INSULATION DETAILS.

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SCALE:
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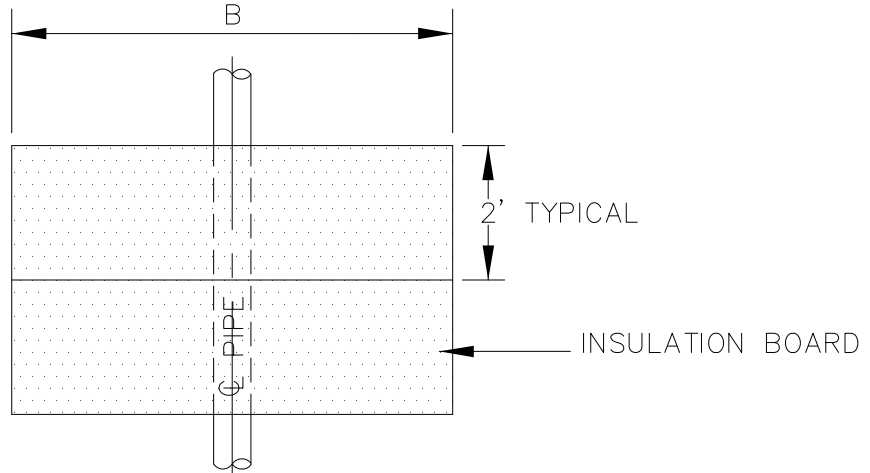
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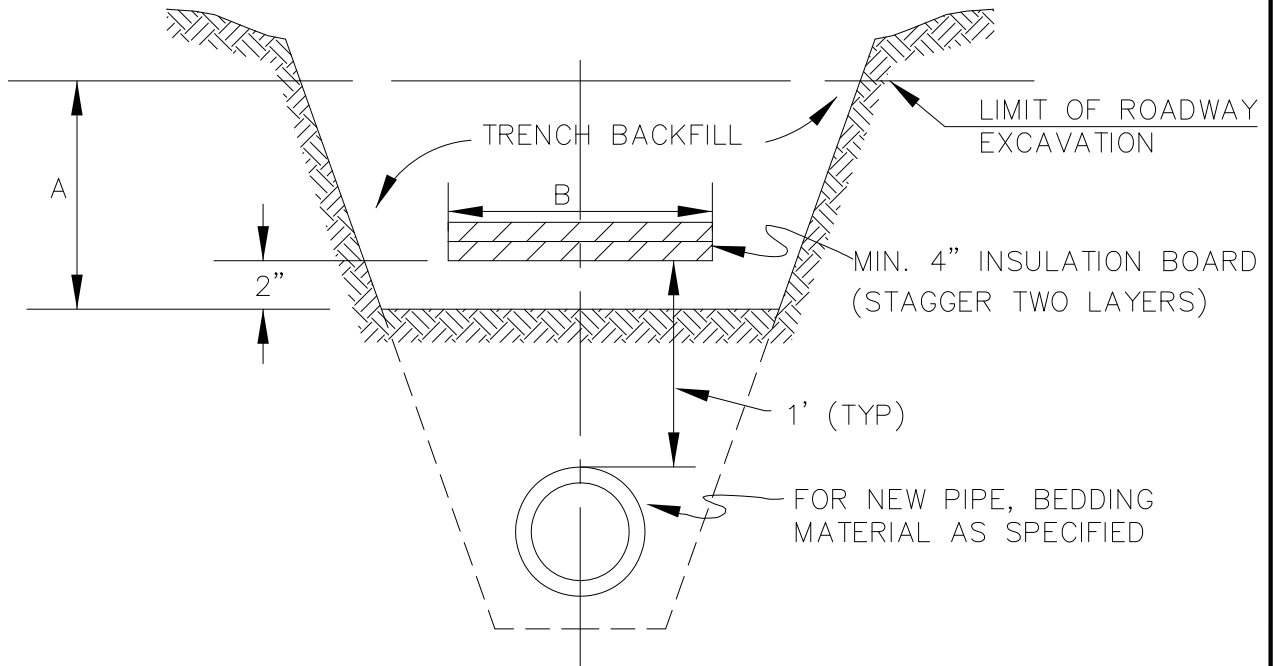
TRENCH BACKFILL AND BEDDING LAYOUT

SECTION #
20.13-
20.16

DETAIL #
20-8



PLAN VIEW



NOTES:

1. THIS DETAIL APPLIES ONLY WHERE INSULATION IS REQUIRED.
2. "A" IS DEPTH FOR PAYMENT UNDER "TRENCH EXCAVATION AND BACKFILL" WHERE INSULATION IS PLACED OVER EXISTING PIPE
3. "B" AS SHOWN ON DRAWINGS OR TO BE DETERMINED BY ENGINEER, FOUR FOOT (4') MINIMUM.

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PIPE INSULATION

SECTION #
20.13

DETAIL #
20-9

GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

1"
3/8"
#4
#10
#40
#200

100
60-100
40-85
25-70
5-40
*0-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE, THE FRACTION OF MATERIAL PASSING THE #200 SIEVE SHALL NOT BE GREATER THAN 35% OF THAT FRACTION PASSING THE #4 SIEVE. THE BEDDING MATERIAL SHALL NOT INCLUDE MECHANICALLY FRACTURED MATERIALS.



FILE.DWG



SCALE:
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CLASS "B" BEDDING MATERIAL

SECTION #
20.16

DETAIL #
20-10

GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

2"
1/2"
#4
#10
#40
#200

100
40-100
20-75
12-60
2-30
*0-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE, THE FRACTION OF MATERIAL PASSING THE #200 SIEVE SHALL NOT BE GREATER THAN 20% OF THAT FRACTION PASSING THE #4 SIEVE.



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SCALE:
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CLASS "C" BEDDING MATERIAL

SECTION #
20.16

DETAIL #
20-11

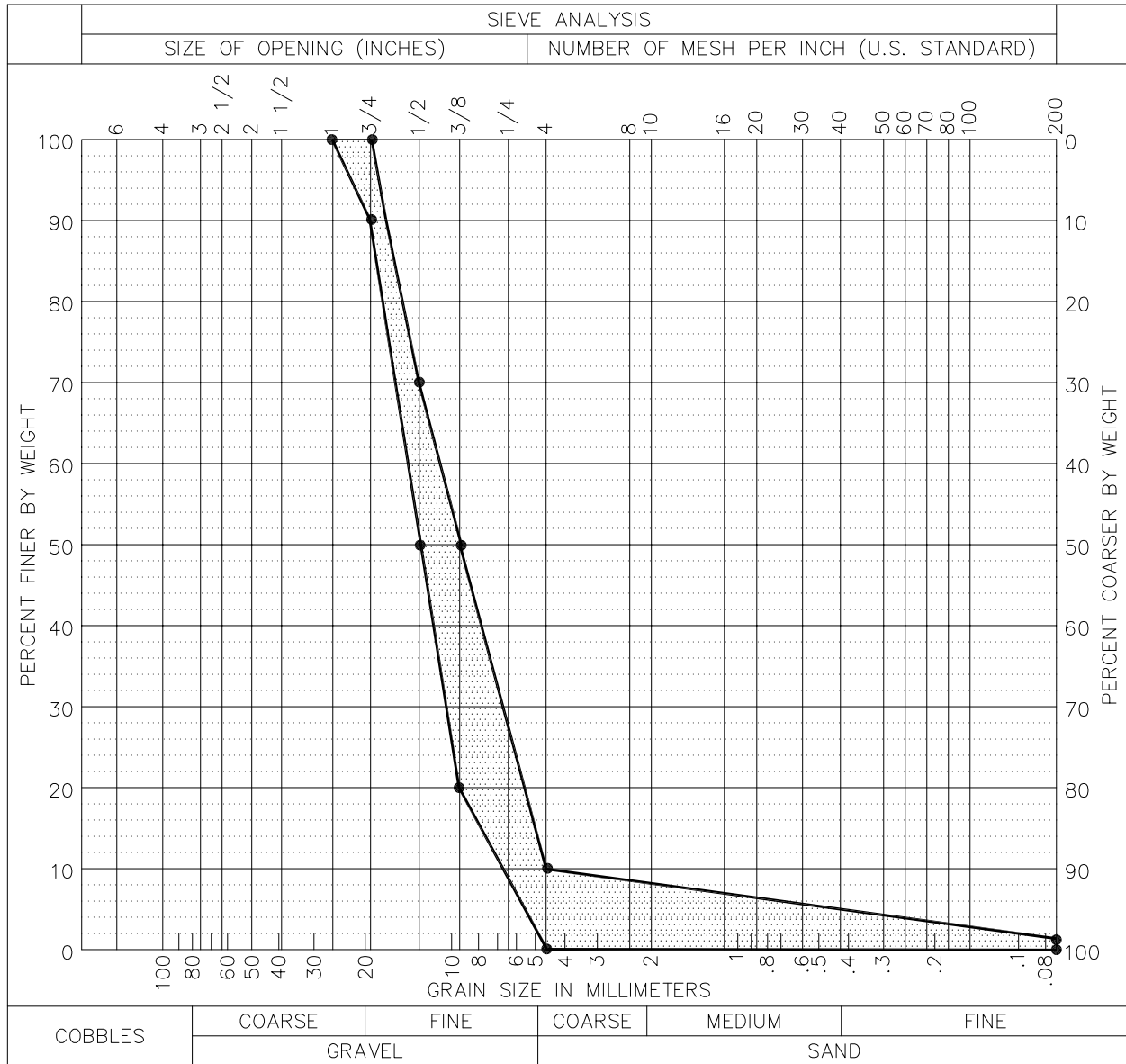
GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

1"	100
3/4"	90-100
1/2"	50-70
3/8"	20-50
#4	0-10
#200	0-1

THE BEDDING MATERIAL SHALL NOT INCLUDE MECHANICALLY FRACTURED MATERIALS.



SCALE:
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APPROVED:

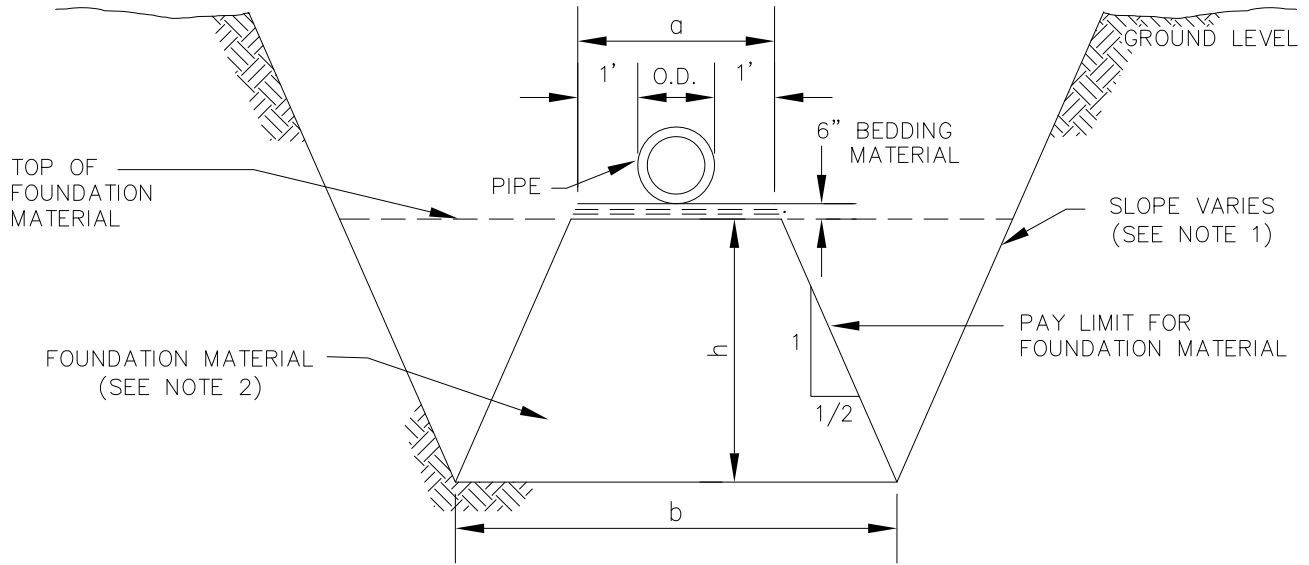
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CLASS "D" BEDDING MATERIAL

SECTION #
20.16

DETAIL #
20-12

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AREA FORMULA

PAY LIMITS

O.D. = OUTSIDE PIPE DIAMETER

$$a = 2' + \text{O.D.}$$

$$b = a + h$$

h = HEIGHT OF FOUNDATION MATERIAL

$$\text{Area} = 1/2 (a + b)h$$

SAMPLE CALCULATION

FOR 18" SINGLE WALL HDPE,
3' FOUNDATION HEIGHT

OUTSIDE PIPE DIAMETER = 21.8"

$$h = 3'$$

$$a = 2' + 21.8" = 45.8" = 3.82'$$

$$b = a + h = 3.82' + 3' = 6.82'$$

$$\text{Area} = 1/2 (a + b)h$$

$$= 1/2 (3.82' + 6.82') * 3'$$

$$= 15.96 \text{ SQUARE FEET}$$

NOTES:

1. TRENCH WALL SLOPES WILL VARY WITH SOIL STRENGTH AND CHARACTER. SLOPES SHALL CONFORM TO OSHA SAFETY STANDARDS.
2. FOUNDATION MATERIALS PLACED AND COMPACTED TO DEPTHS SHOWN IN THE DRAWINGS OR AS DETERMINED BY THE ENGINEER. COMPACT FOUNDATION MATERIAL TO 95% MAXIMUM DENSITY, UNLESS OTHERWISE SPECIFIED.
3. USE THE AREA FORMULA TO CALCULATE THE AREA OF PAY LIMITS FOR ALL TYPES AND SIZES OF PIPE.



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FOUNDATION MATERIALS

SECTION #
20.19

DETAIL #
20-13

GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

8"	100
3"	70-100
1-1/2"	55-100
3/4"	45-85
#4	20-60
#10	12-50
#40	4-30
#200	*2-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE, THE FRACTION OF MATERIAL PASSING THE #200 SIEVE SHALL NOT BE GREATER THAN 20% OF THAT FRACTION PASSING THE #4 SIEVE.



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TYPE II CLASSIFIED FILL AND BACKFILL

SECTION #
20.21

DETAIL #
20-14

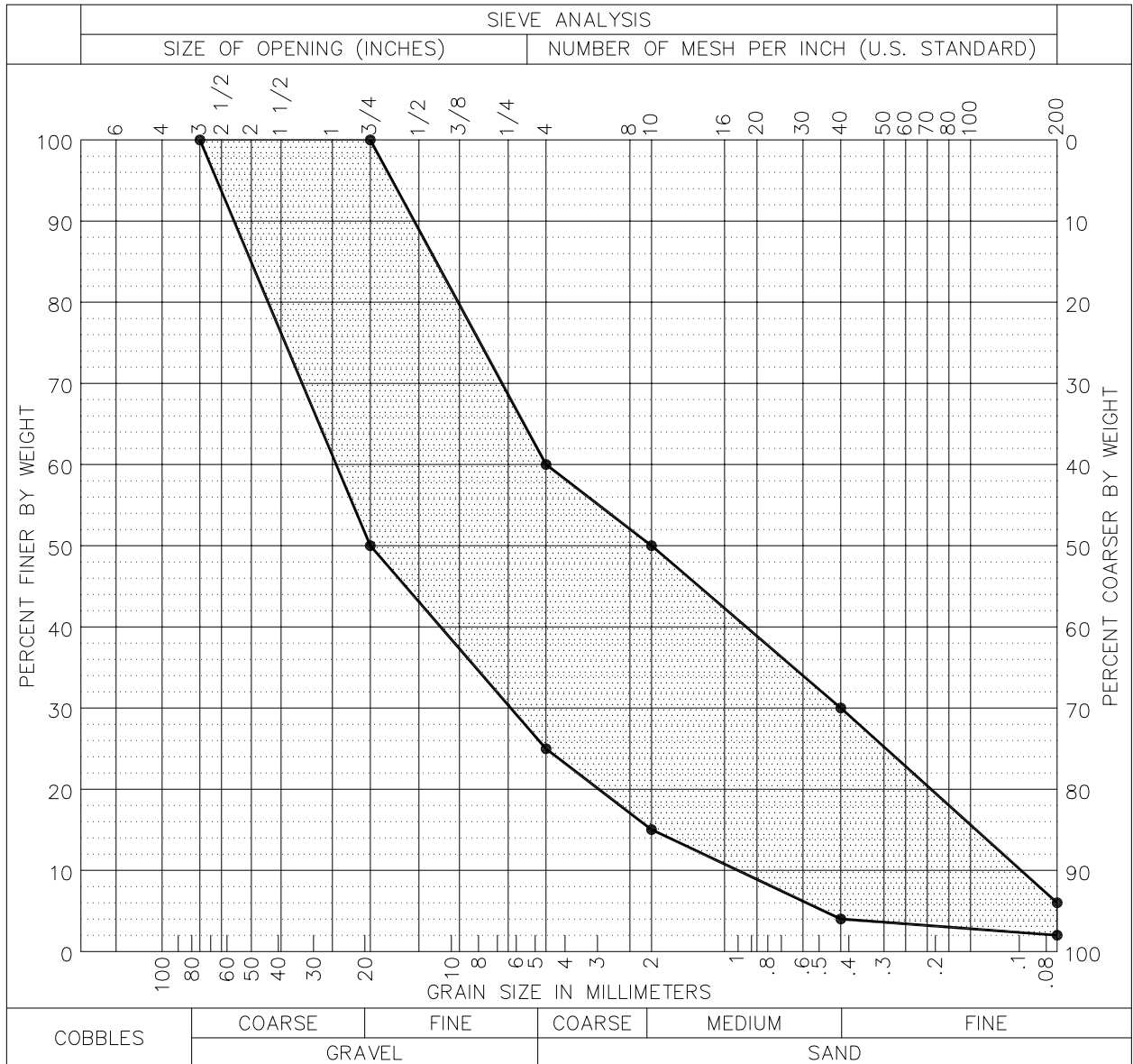
GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

3"	100
3/4"	50-100
#4	25-60
#10	15-50
#40	4-30
#200	*2-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE, THE FRACTION OF MATERIAL PASSING THE #200 SIEVE SHALL NOT BE GREATER THAN 20% OF THAT FRACTION PASSING THE #4 SIEVE.



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TYPE II-A CLASSIFIED FILL AND BACKFILL

SECTION #
20.21

DETAIL #
20-15

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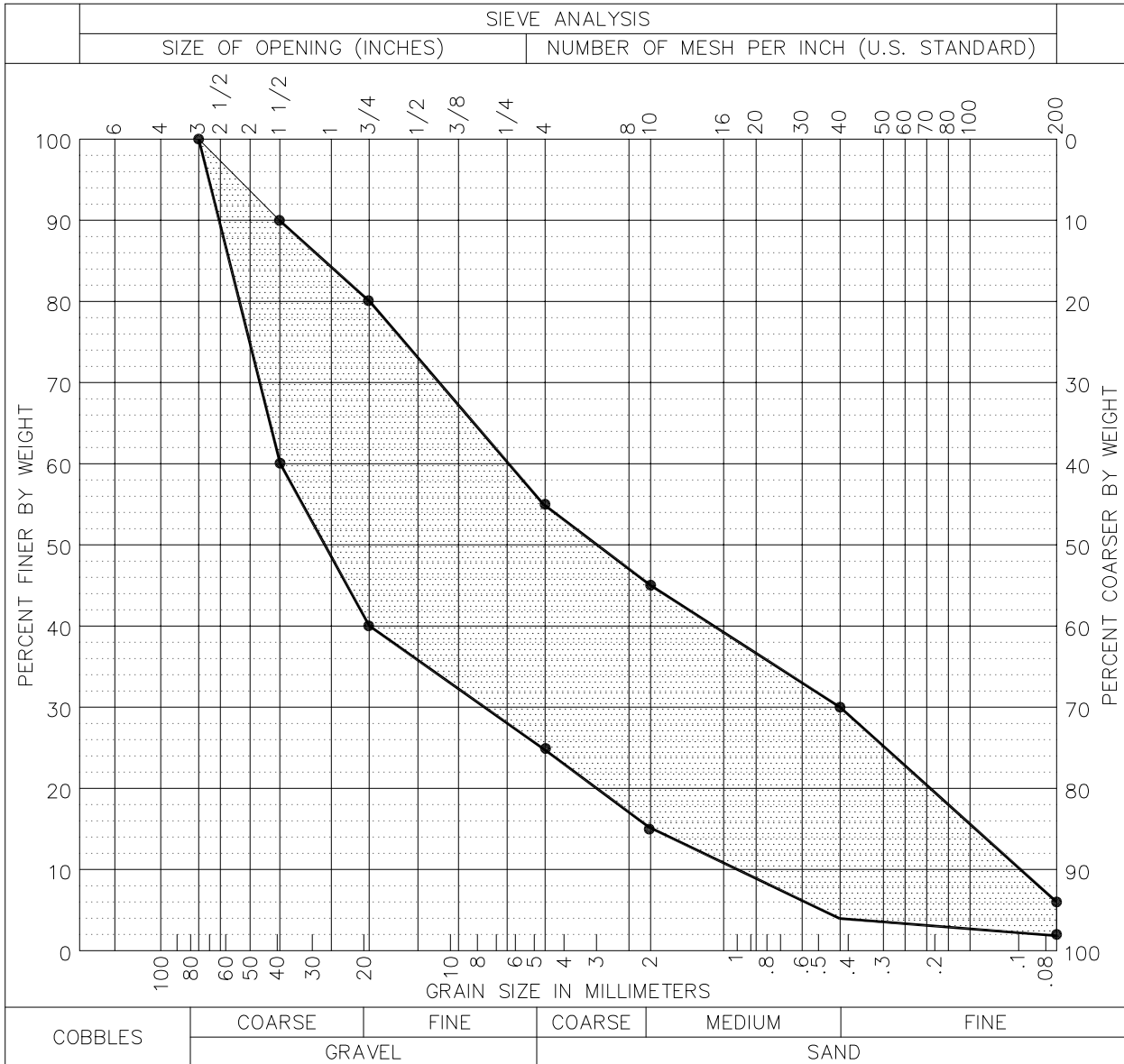
GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

3"	100
1 1/2"	60-90
3/4"	40-80
#4	25-55
#10	15-45
#40	4-30
#200	2-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE, AT LEAST THIRTY PERCENT (30%) OF THE COARSE AGGREGATE PARTICLES SHALL HAVE ONE OR MORE MECHANICALLY FRACTURED FACE.



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TYPE V CLASSIFIED FILL AND BACKFILL

SECTION #
20.21

DETAIL #
20-16

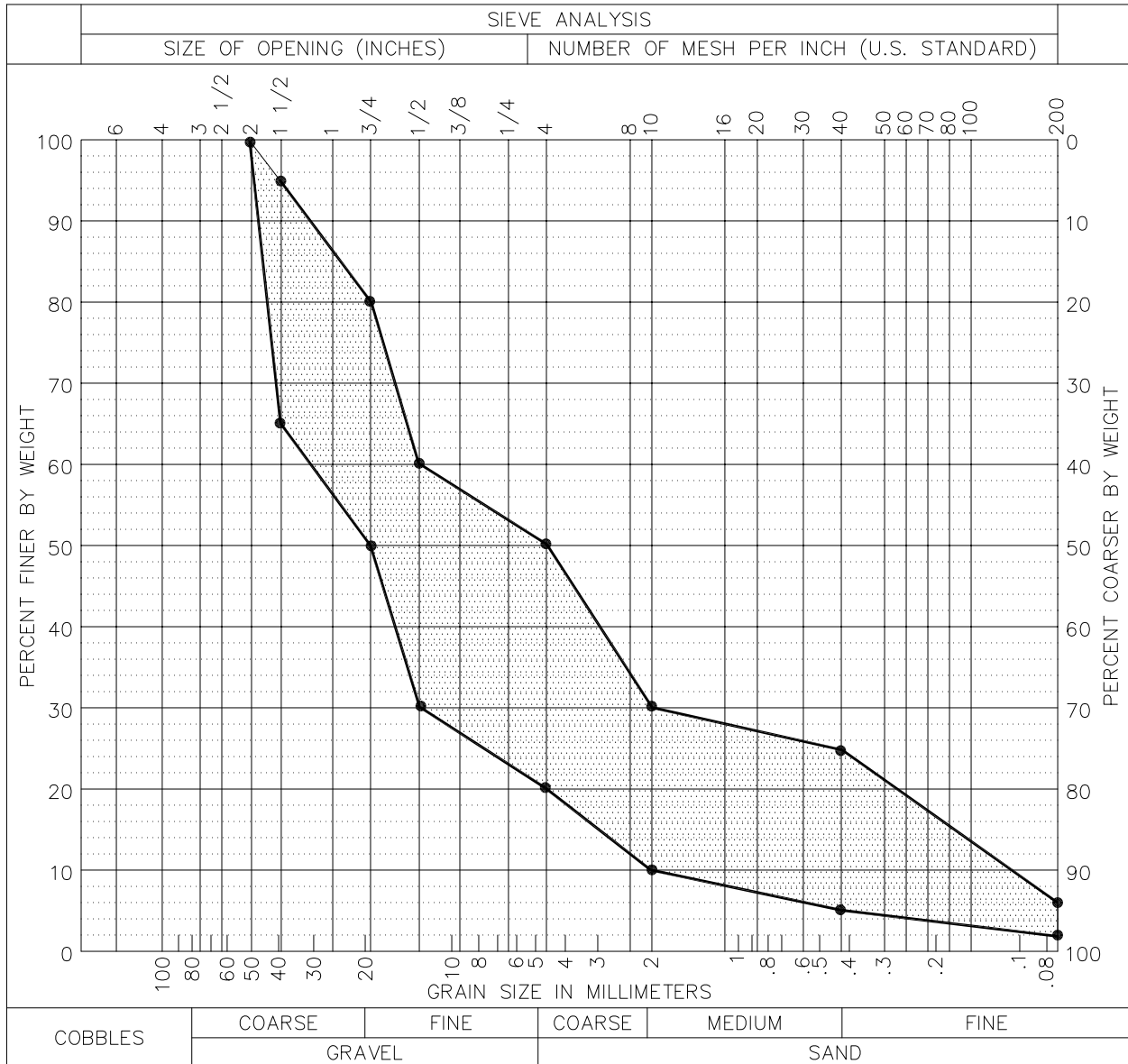
GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

2"	100
1 1/2"	65-95
3/4"	50-80
1/2"	30-60
#4	20-50
#10	10-30
#40	5-25
#200	2-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE AT LEAST FORTY PERCENT (40%) OF THE COARSE AGGREGATE PARTICLES SHALL HAVE ONE OR MORE MECHANICALLY FRACTURED FACE.



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TYPE VI CLASSIFIED FILL AND BACKFILL

SECTION #
20.21
DETAIL #
20-17

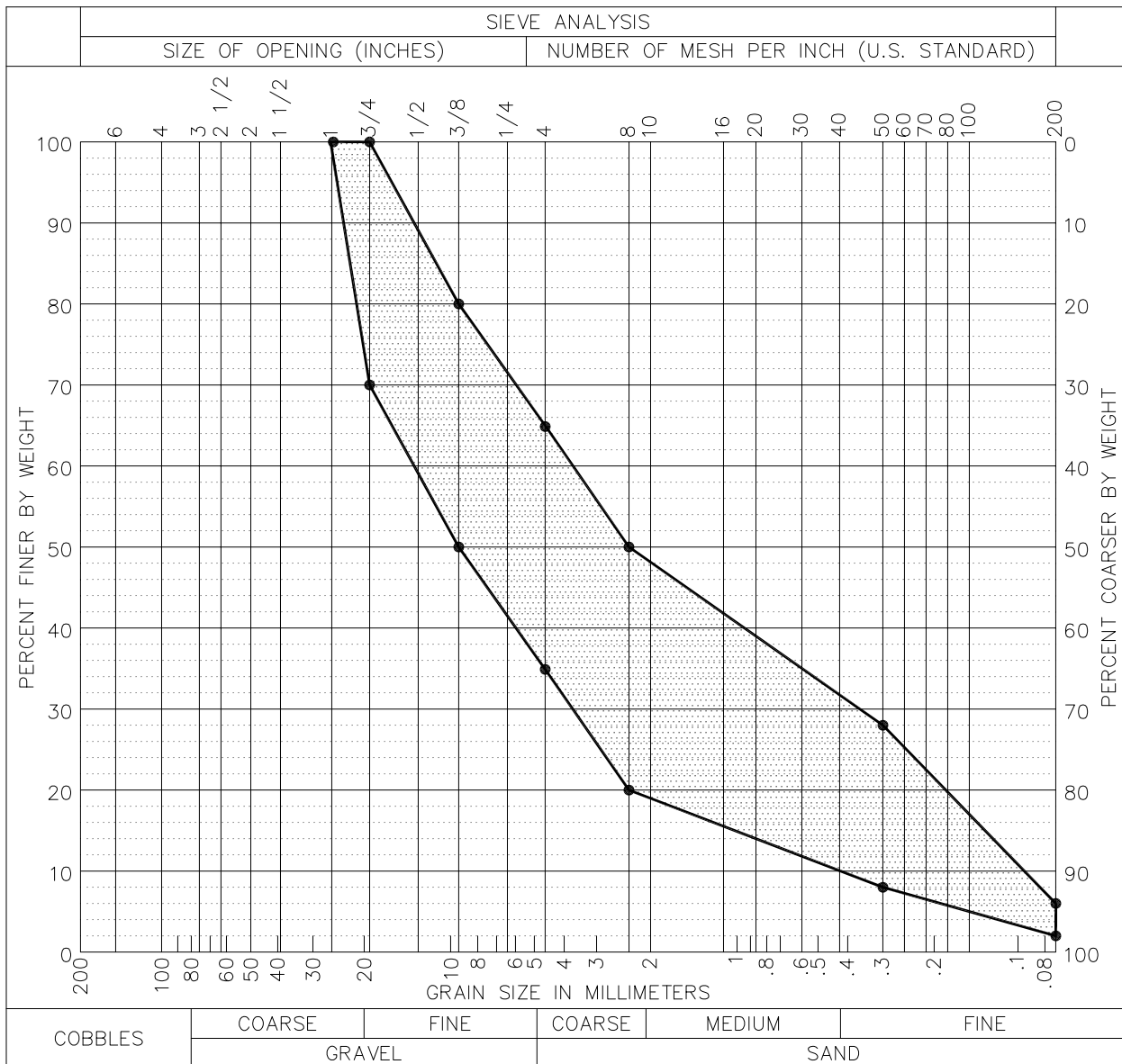
GRADING LIMITS

U.S. STANDARD SIEVE

CUMULATIVE % PASSING
BY WEIGHT

1"	100
3/4"	70-100
3/8"	50-80
#4	35-65
#8	20-50
#50	8-28
#200	*2-6

*IN ADDITION TO THE GRADING LIMITS LISTED ABOVE, THE FRACTION OF MATERIAL PASSING THE #200 SIEVE SHALL NOT BE GREATER THAN 75% OF THAT FRACTION PASSING THE #50 SIEVE.



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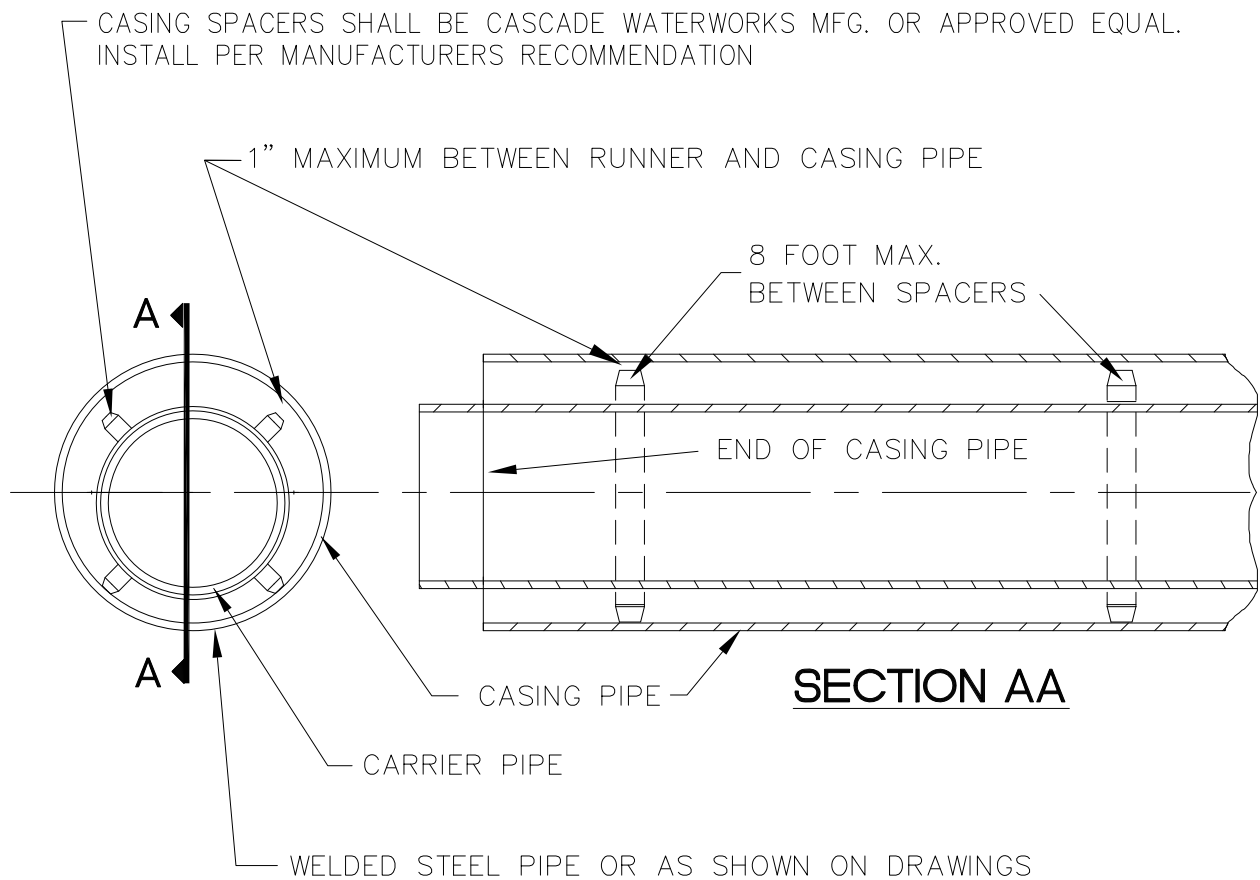


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LEVELING COURSE

SECTION #
20.22

DETAIL #
20-18



NOTES:

1. CASING PIPE SHALL BE WELDED STEEL PIPE, AND GAUGE SHALL BE AS SHOWN ON DRAWINGS. CASING PIPE SHALL BE DESIGNED FOR ALL LOADS FOR EACH APPLICATION.
2. INSTALL CASING SPACERS A MAXIMUM OF ONE FOOT (1') FROM EACH SIDE OF EACH PIPE JOINT. CASING SPACERS SHALL BE CASCADE WATERWORKS MFG. STAINLESS STEEL WITH POLYETHYLENE RUNNERS OR APPROVED EQUAL.
3. ENDS OF CASING PIPE SHALL BE SEALED WITH SYNTHETIC RUBBER SEAL WITH STAINLESS STEEL BANDS. CASING SHALL BE WATERTIGHT.
4. CARRIER PIPE SHALL HAVE FIELD LOK® GASKETS OR APPROVED EQUAL INSTALLED ENTIRE LENGTH OF CASING PIPE AND EXTEND ONE FULL PIPE LENGTH BEYOND END OF CASING.
5. JOINT BONDS OR THAW WIRES SHALL BE INSTALLED THE ENTIRE LENGTH OF CARRIER PIPE PER AWWU DCPM CORROSION CONTROL MAGNESIUM BAG ANODE INSTALLATION DETAIL.
6. CORROSION ANALYSIS SHALL BE PERFORMED FOR CASING PIPE.



SCALE:
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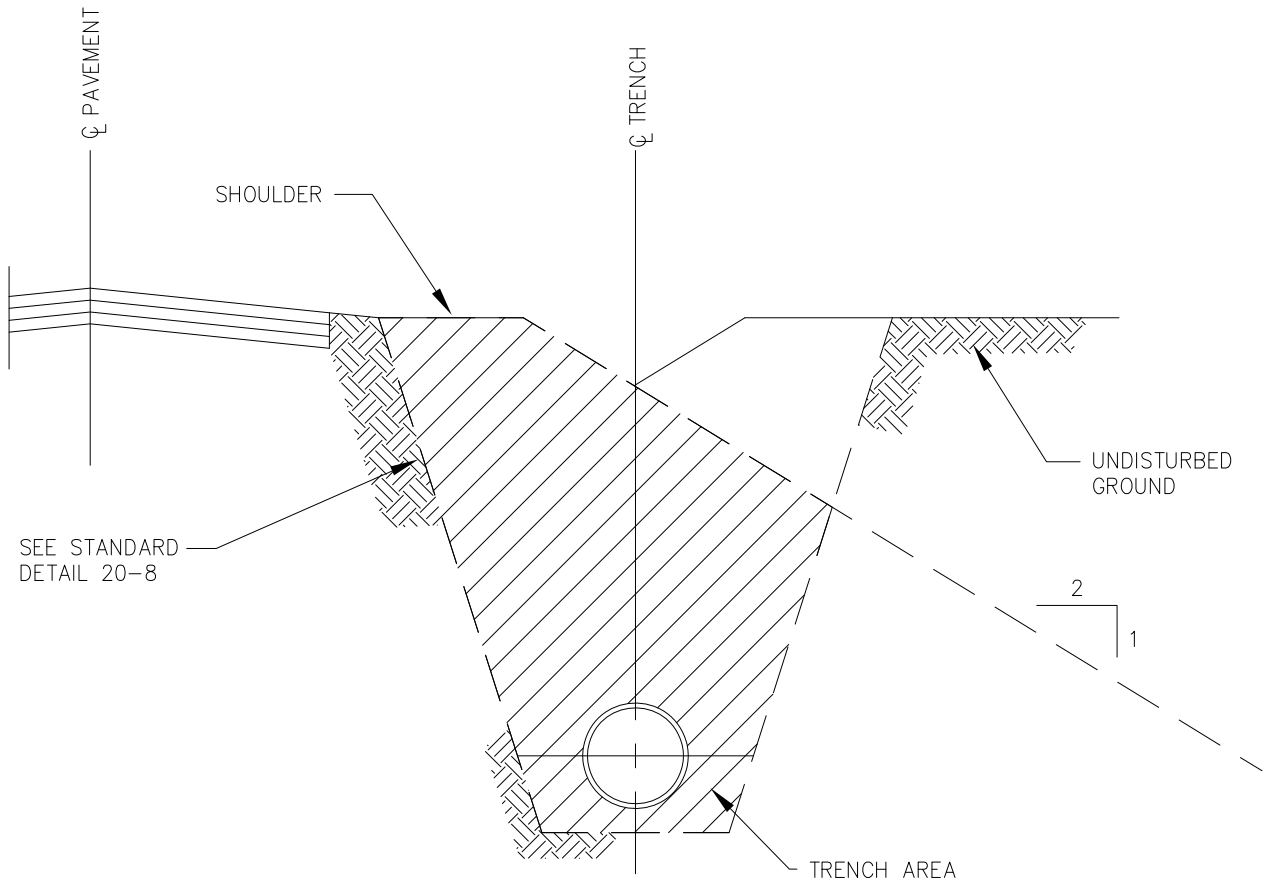
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PIPE ENCASEMENT

SECTION #
20.29

DETAIL #
20-19



NOTES:

1. REPLACE ALL MATERIAL THAT IS TO BE BACKFILLED WITHIN THE ABOVE-DESCRIBED AREA IN ONE-FOOT LIFTS PER DIVISION 20, SECTION 20.21, ARTICLE 21.3 – CONSTRUCTION.
2. BACKFILL SHALL BE FREE OF CLAYS AND ORGANIC MATERIALS.
3. COMPACT BACKFILL BY MECHANICAL MEANS WITHOUT THE AID OF WATER.
4. RESHAPE DITCH LINE IN SUCH A MANNER AS TO PROVIDE PROPER DRAINAGE; REPLACE SHOULDER OF THE ROAD AT A UNIFORM SLOPE NOT TO EXCEED 2 TO 1.



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COMPACTION OF BACKFILL WITHIN THE RIGHT-OF-WAY

SECTION #
20.30

DETAIL #
20-20