

Minimum Standards for Driveway Construction

Village of Bear Creek

An exception to the following requirements may only be granted by city council. The needs of each drainage system are considered independently, and meeting these minimum requirements does not guarantee approval of a driveway permit.

Requirement 1: Gradients Requiring Storm Water Bypass

A culvert or dip-style driveway is required if there is a ditch on the right-of-way guiding significant amounts of storm water parallel to the street.

If the road has a grade of 1% or greater (“road grade”), a culvert or dip-style driveway is required unless the ground slopes down from the street at a grade of greater than 2 times the road grade, in which case water runs principally onto the property instead of along the street.

Requirement 2: Minimum Culvert Size

The driveway permit authority, with reference to the culvert requirements listed in Table 3, and by examination of the terrain and improvements affecting storm drainage at the applicant’s proposed driveway site, shall specify a minimum culvert size within the issued permit. This minimum culvert size is the diameter of a single culvert with a circular cross-section, such that the culvert gives adequate storm drainage capacity. In the following, “minimum permitted area” means the area of a circle having diameter equal to the minimum culvert size that the driveway permit authority specified.

If the applicant does not wish to use a single culvert, the applicant may use multiple pipes placed close to each other. Table 1 shows the sufficient pipe diameter for some multiple-pipe designs given the single-pipe diameter. Table 1 is for reference only and applies if all of the multiple pipes are the same design diameter; other multiple-pipe options are possible so long as:

1. the total cross-sectional area of all pipes is at least as much as the minimum permitted area, and
2. each pipe is at least 10 inches in diameter; or, if the pipe cross section is not circular, the pipe must have interior dimensions of at least 8 inches in each direction.

Residents are responsible for keeping their culverts clear of obstructions. Larger diameter culverts are easier to keep clear and less likely to become obstructed. Please make sure that you would be able to clear an obstruction near the middle of the pipe(s) if one occurred.

Requirement 3: Culvert Design

Except for the end treatment (e.g., rip-rap), culverts shall be designed as shown in Figures 3 and 4. Other end treatments are allowed so long as the end treatment used:

1. prevents erosion, including undercutting, near all pipe ends;
2. prevents silting in of the upstream end of the culvert;
3. is made of materials that will be functional for at least 20 years; and
4. is described, including a diagram that specifies the materials used and their thickness and placement, in the information submitted with the driveway permit application.

The Village of Bear Creek recommends but does not require reinforcing the pipe ends enough to prevent crushing by a 4 ton weight distributed over 50 square inches (approximately the weight exerted by the tires of a large delivery truck). It is frequently trucks that cause crushed culverts because they are heavier than passenger vehicles and they are much more likely to roll a wheel off the driveway as they turn off of, or onto, the street. A crushed culvert that blocks the flow of water is a violation of City ordinance.

Requirement 4: Dip-Style Driveway

If the terrain does not allow for a sufficiently large culvert (Requirement 2) plus the required amount of cover above the culvert (Requirement 3), and the gradient of the land (Requirement 1) requires a culvert or dip-style driveway, then either:

1. a dip-style driveway in accordance with diagram 82.302B, "Asphalt Dip-Style Driveway", or Figure 5, "Concrete Dip-Style Driveway", is required; or
2. The property owner may discuss with city council groundwork that would allow a culvert installation. This discussion should precede the property owner's driveway permit application.

Diagram 82.302B is a Travis County dip-style driveway standard that has been modified to allow driveway width as low as 10 feet (original was 12 feet). Diagram 82.302B shows a curb radius of 10 feet, but the city accepts a curb radius as low as 5 feet, as in Figure 5.

Requirement 5: Pre-inspection of Asphalt and Concrete Driveways

1. Before a permit is issued for the placement of asphalt or concrete driveway(s), the plan and site must be approved by the Driveway Permit Authority.
2. The refundable deposit for an asphalt driveway permit is \$750.00.
3. The refundable deposit for a concrete driveway permit is \$1500.00.

4. Deposits are payable to the Secretary of the Village of Bear Creek.
5. Deposits will be refunded within 60 days of approval of the final project by the Driveway Permit Authority and the City Council.

**TABLE 1
EQUIVALENT CULVERT SIZES**

Specified Pipe Diam.	TxDOT Steel Pipe Arch	Double	Triple	Quad.
18"	Design 2 – 21"x 15"	-	-	-
24"	Design 3 – 28"x 20"	18"	-	-
30"	Design 4 – 35" x 24"	24"	-	18"
36"	Design 5 – 42"x 29"	30"	24"	-
42"	Design 6 – 49"x 33"	36"	30"	24"
48"	Design 7 – 57"x 38"	36"	30"	-
54"	Design 8 – 64"x 43"	42"	36"	30"
60"	Design 9 – 71"x 47"	48"	36"	-
66"	Design 10 – 73" x 55"	48"	42"	36"
72"	Design 11 – 81"x 59"	54"	48"	42"
78"	Design 12 – 87"x 63"	60"	48"	42"

TABLE 3
REQUIRED DRIVEWAY CULVERTS
BEAR CREEK OAKS, SECTION 1

Description	Street	Q ₁₀₀ (cfs)	Q ₂₅ (cfs)	Avg. Slope (%)	Req. Diam. (in.)
Lot 37	Bear Creek Dr.	-	-	-	18
Lot 36	Bear Creek Dr.	38.5	27.2	3.33	36
Lot 35	Bear Creek Dr.	28.17	19.95	3.16	30
Lot 1	Bear Creek Dr.	-	-	-	18
Lot 2	Bear Creek Dr.	-	-	-	18
Lot 4	Bear Creek Dr.	-	-	-	18
Lot 5	Bear Creek Dr.	-	-	-	18
Lot 6	Bear Creek Dr.	-	-	-	18
Rose Subdivision					
Lot 1	Bear Creek Dr.	-	-	-	18
Lot 2	Bear Creek Dr.	-	-	-	18
Daisley Subdivision					
Lot 1	Bear Creek Dr.	-	-	-	18
Bear Creek Oaks, Section 1					
Lot 7	Bear Creek Dr.	-	-	-	18
Lot 8	Bear Creek Dr.	-	-	-	18
Lot 9	Bear Creek Dr.	-	-	-	18
Lot 10	Bear Creek Dr.	-	-	-	18
Lot 11	Bear Creek Dr.	-	-	-	18
Lot 12	Bear Creek Dr.	-	-	-	18
Lot 13	Bear Creek Dr.	-	-	-	18
Lot 14	Bear Creek Dr.	-	-	-	18
Lot 15	Bear Creek Dr.	-	-	-	18
Lot 16	Bear Creek Dr.	27.8	20	6.67	30
Lot 17C	Bear Creek Dr.	17	12.2	6.67	24
Lot 17B	Bear Creek Dr.	17	12.2	6.67	24
Lot 17A	Bear Creek Dr.	6.4	4.6	4.6	18
Lot 18	Bear Creek Dr.	22.1	15.9	4.8	30
Lot 19	Bear Creek Dr.	47.95	34.45	3.33	36
Lot 20	Bear Creek Dr.	-	-	-	18
Lot 46	Bear Creek Dr.	-	-	-	18
Lot 45	Bear Creek Dr.	-	-	-	18
Lot 44	Bear Creek Dr.	17.5	12.5	4.8	24
Lot 43	Bear Creek Dr.	20.6	15.2	1.0	30
Lot 42	Bear Creek Dr.	20.6	15.2	1.0	30
Lot 41	Bear Creek Dr.	34	24.4	5.1	30

Notes:

1. Dip-type driveways may be used when conditions allow.
2. See Table 1 for equivalent culvert sizes.

TABLE 3 (Continued)
REQUIRED DRIVEWAY CULVERTS
BEAR CREEK OAKS, SECTION 1

Description	Street Frontage	Q ₁₀₀ (cfs)	Q ₂₅ (cfs)	Avg. Slope (%)	Req. Diam. (in.)
Lot 40	Bear Creek Dr.	81.4	58.4	2.0	48
Lot 39	Bear Creek Dr.	26	18.7	6.0	30
Lot 38B	Bear Creek Dr.	21.2	15.3	2.67	24
Lot 34A	Bear Creek Drive	-	-	-	18
Lot 34B	Bear Creek Drive	-	-	-	18
Lot 34C	Bear Creek Drive	-	-	-	18
Lot 33	South Madrone Trail	-	-	-	18
Lot 32	South Madrone Trail	-	-	-	18
Lot 31	South Madrone Trail	-	-	-	18
Lot 30	South Madrone Trail	-	-	-	18
Lot 29	South Madrone Trail	-	-	-	18
Lot 28	South Madrone Trail	-	-	-	18
Lot 27	South Madrone Trail	-	-	-	18
Lot 26	South Madrone Trail	-	-	-	18
Lot 25	South Madrone Trail	-	-	-	18
Lot 24	South Madrone Trail	-	-	-	18
Lot 23B	South Madrone Trail	-	-	-	18
Lot 23A	South Madrone Trail	-	-	-	18
Lot 22B	South Madrone Trail	-	-	-	18
Lot 22A	South Madrone Trail	-	-	-	18
Lot 21	South Madrone Trail	-	-	-	18
Lot 47	South Madrone Trail	-	-	-	18
Lot 48	South Madrone Trail	-	-	-	18
Lot 49	South Madrone Trail	-	-	-	18
Lot 50 West	South Madrone Trail	-	-	-	18
Lot 50 East	South Madrone Trail	19.5	13.9	2.67	24
Lot 51	South Madrone Trail	45	32.2	1.5	36
Lot 52	South Madrone Trail	40.4	26.1	3.0	36

Notes:

1. Dip-type driveways may be used when conditions allow.
2. See Table 1 for equivalent culvert sizes.

TABLE 3 (Continued)
REQUIRED DRIVEWAY CULVERTS
BEAR CREEK OAKS, SECTION 2

Description	Street Frontage	Q ₁₀₀ (cfs)	Q ₂₅ (cfs)	Avg. Slope (%)	Req. Diam. (in.)
Lot 18A	North Madrone Trail	155.4	109.8	4.0	60
Lot 18B	North Madrone Trail	173.9	122.9	3.2	66
Lot 19	North Madrone Trail	31.2	22.4	1.25	*36
Lot 20	North Madrone Trail	61.2	43.8	1.0	*42
Lot 21	North Madrone Trail	72.2	51.7	6.0	*42
Lot 22	North Madrone Trail	-	-	-	18
Lot 23	North Madrone Trail	-	-	-	18
Lot 24	North Madrone Trail	-	-	-	18
Lot 25	North Madrone Trail	-	-	-	18
Lot 26	North Madrone Trail	-	-	-	18
Hjornevik Acres					
Lot 1	North Madrone Trail	-	-	-	18
Lot 2	North Madrone Trail	-	-	-	18
Bear Creek Oaks, Section 2					
Lot 28	North Madrone Trail	-	-	-	18
Lot 29	North Madrone Trail	-	-	-	18
Lot 30	North Madrone Trail	-	-	-	18
Lot 31	North Madrone Trail	-	-	-	18
Lot 32	North Madrone Trail	-	-	-	18
Lot 33	North Madrone Trail	-	-	-	18
Lot 34	Niles Cove	-	-	-	18
Lot 35	Niles Cove	-	-	-	18
Lot 37	Niles Cove	-	-	-	18
Lot 38	Niles Cove	-	-	-	18
Lot 39 East	North Madrone Trail	30.2	22.1	1.0	30
Lot 39 West	North Madrone Trail	24.1	17.6	1.0	30
Lot 1D	North Madrone Trail	31.4	22.8	1.5	30
Lot 1C	North Madrone Trail	15.7	11.4	1.0	24
Lot 1B	North Madrone Trail	17.3	12.7	1.0	24
Lot 1A	North Madrone Trail	-	-	-	18
Lot 5B	North Madrone Trail	-	-	-	18
Lot 40	North Madrone Trail	-	-	-	18

* Pipe sized with the assumption the 36" culvert under North Madrone Trail next to Lot 8 has been replaced with recommended pipe diameter.

Notes:

1. Dip-type driveways may be used when conditions allow
2. See Table 1 for equivalent culvert sizes.

TABLE 3 (Continued)
REQUIRED DRIVEWAY CULVERTS
BEAR CREEK OAKS, SECTION 2

Description	Street Frontage	Q ₁₀₀ (cfs)	Q ₂₅ (cfs)	Avg. Slope (%)	Req. Diam. (in.)
Lot 9A	North Madrone Trail	81	57.9	1.0	48
Lot 9A	Cedar Cove	9	6.5	2.33	18
Lot 9B	North Madrone Trail	65.7	47.1	2.0	42
Lot 10	North Madrone Trail	65.7	47.1	2.0	42
Lot 11 East	North Madrone Trail	31.4	22.5	2.0	30
Lot 11 West	North Madrone Trail	14.9	10.7	6.8	24
Lot 12	North Madrone Trail	78	55.5	1.0	48
Lot 13	NMT (East of Creek)	93.9	68.1	1.0	54
Lot 14	NMT (West of Creek)	-	-	-	18
Lot 15	North Madrone Trail	-	-	-	18
Lot 16	North Madrone Trail	-	-	-	18
Lot 17	North Madrone Trail	198	144	2.5	72

Notes:

1. Dip-type driveways may be used when conditions allow
2. See Table 1 for equivalent culvert sizes.

TABLE 3 (Continued)
REQUIRED DRIVEWAY CULVERTS
BEAR CREEK OAKS, SECTION 3

Description	Street Frontage	Q ₁₀₀ (cfs)	Q ₂₅ (cfs)	Avg. Slope (%)	Req. Diam. (in.)
Lot 1	North Madrone Trail	198	144	2.5	72
Lot 2	North Madrone Trail	198	144	2.5	72
Lot 3	North Madrone Trail	198	144	2.0	72
Lot 4	North Madrone Trail	198	144	2.0	72
Lot 5	North Madrone Trail	178	127	2.5	66
Lot 6	North Madrone Trail	149	107	2.5	60
Lot 7	North Madrone Trail	98	70.3	6.7	48
Lot 8	North Madrone Trail	15.6	11.2	6.7	24
Lot 9	North Madrone Trail	15.6	11.2	2.0	24
Lot 2A	Cedar Cove	5.3	3.8	1.0	18
Lot 3	Cedar Cove	9.18	6.62	10.0	18
Lot 4	Cedar Cove	9.18	6.62	10.0	18
Lot 5A	Cedar Cove	9.18	6.62	1.0	18
Lot 6	Cedar Cove	11.2	8.05	10.0	24
Lot 7	Cedar Cove	12.3	8.83	10.0	24
Lot 8	Cedar Cove	-	-	-	18
Lot 17	South Madrone Trail	-	-	-	18
Lot 16	South Madrone Trail	-	-	-	18
Lot 15	South Madrone Trail	-	-	-	18
Lot 14	South Madrone Trail	-	-	-	18
Lot 13	South Madrone Trail	17	12.3	1.0	24
Lot 12	South Madrone Trail	32	23	1.0	36
Lot 11	South Madrone Trail	56.6	40	1.0	42
Lot 10	South Madrone Trail	17.6	12.3	1.0	24
Lot 19A	South Madrone Trail	-	-	-	18
Lot 19B	South Madrone Trail	-	-	-	18
Lot 19C	South Madrone Trail	-	-	-	18
Lot 18	South Madrone Trail	-	-	-	18
Lot 25	Madrone Cove	13.2	9.5	5.25	24
Lot 24	Madrone Cove	15.6	11.2	5.0	24

* Pipe sized with the assumption the 36" culvert under North Madrone Trail next to Lot 8 has been replaced with recommended pipe diameter.

Notes:

1. Dip-type driveways may be used when conditions allow
2. See Table 1 for equivalent culvert sizes.

TABLE 3 (Continued)
REQUIRED DRIVEWAY CULVERTS
BEAR CREEK OAKS, SECTION 3

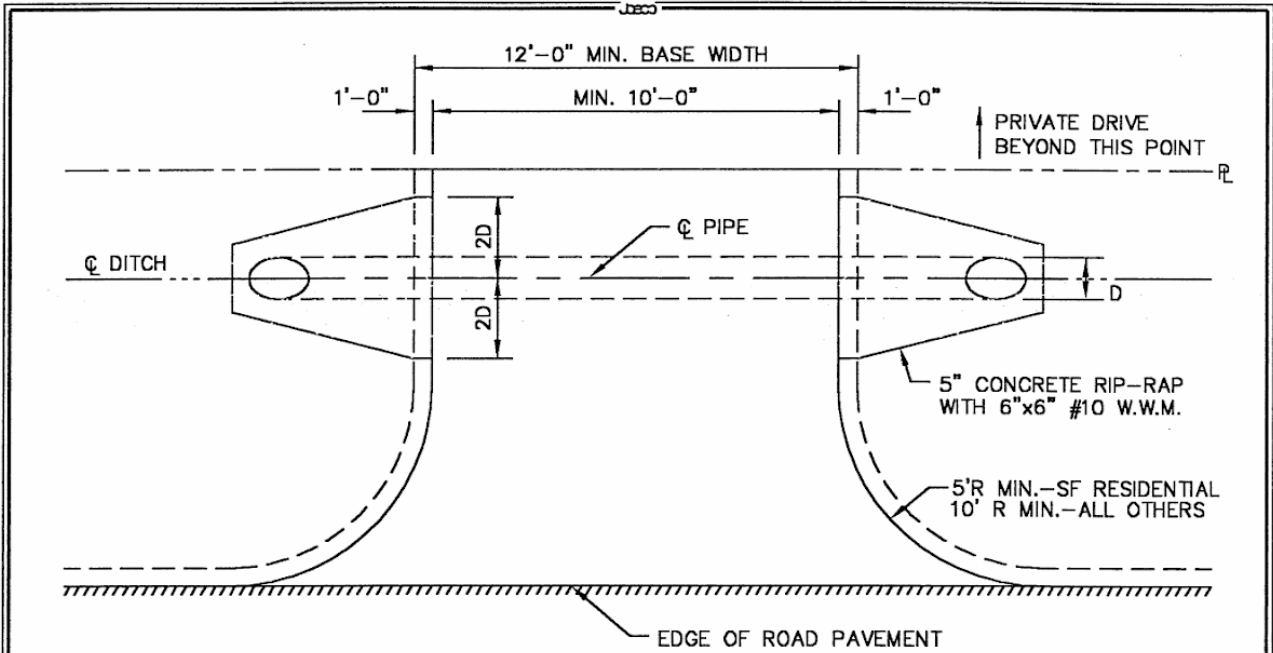
Description	Street Frontage	Q ₁₀₀ (cfs)	Q ₂₅ (cfs)	Avg. Slope (%)	Req. Diam. (in.)
Lot 23	Madrone Cove	15.6	11.2	5.0	24
Lot 22	Madrone Cove	-	-	-	18
Lot 21	Madrone Cove	-	-	-	18
Lot 20B	Madrone Cove	-	-	-	18
Lot 20A	Madrone Cove	-	-	-	18
Lot 26	North Madrone Trail	-	-	-	18
Lot 27	North Madrone Trail	14.6	10.4	3.5	24
Lot 28	North Madrone Trail	90.6	64.2	2.25	48
Lot 29	North Madrone Trail	116.9	82.7	2.0	54
Lot 30	North Madrone Trail	149.1	105.5	1.0	66

Notes:

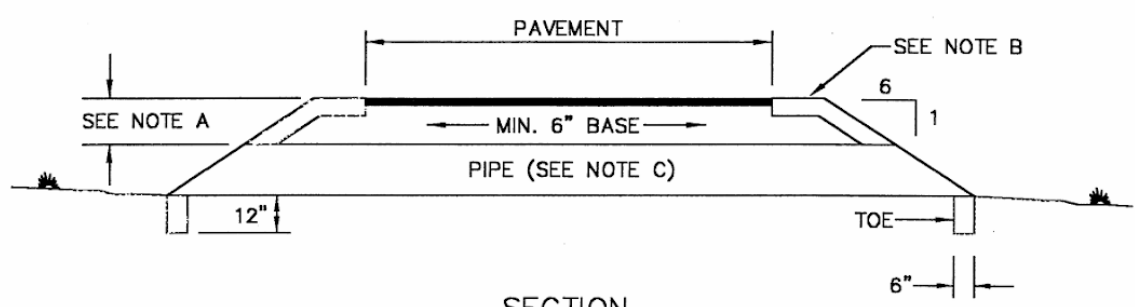
1. Dip-type driveways may be used when conditions allow
2. See Table 1 for equivalent culvert sizes.

NOTES:

- A. MIN. 6"
- B. 5" CON
- C. PIPE SI



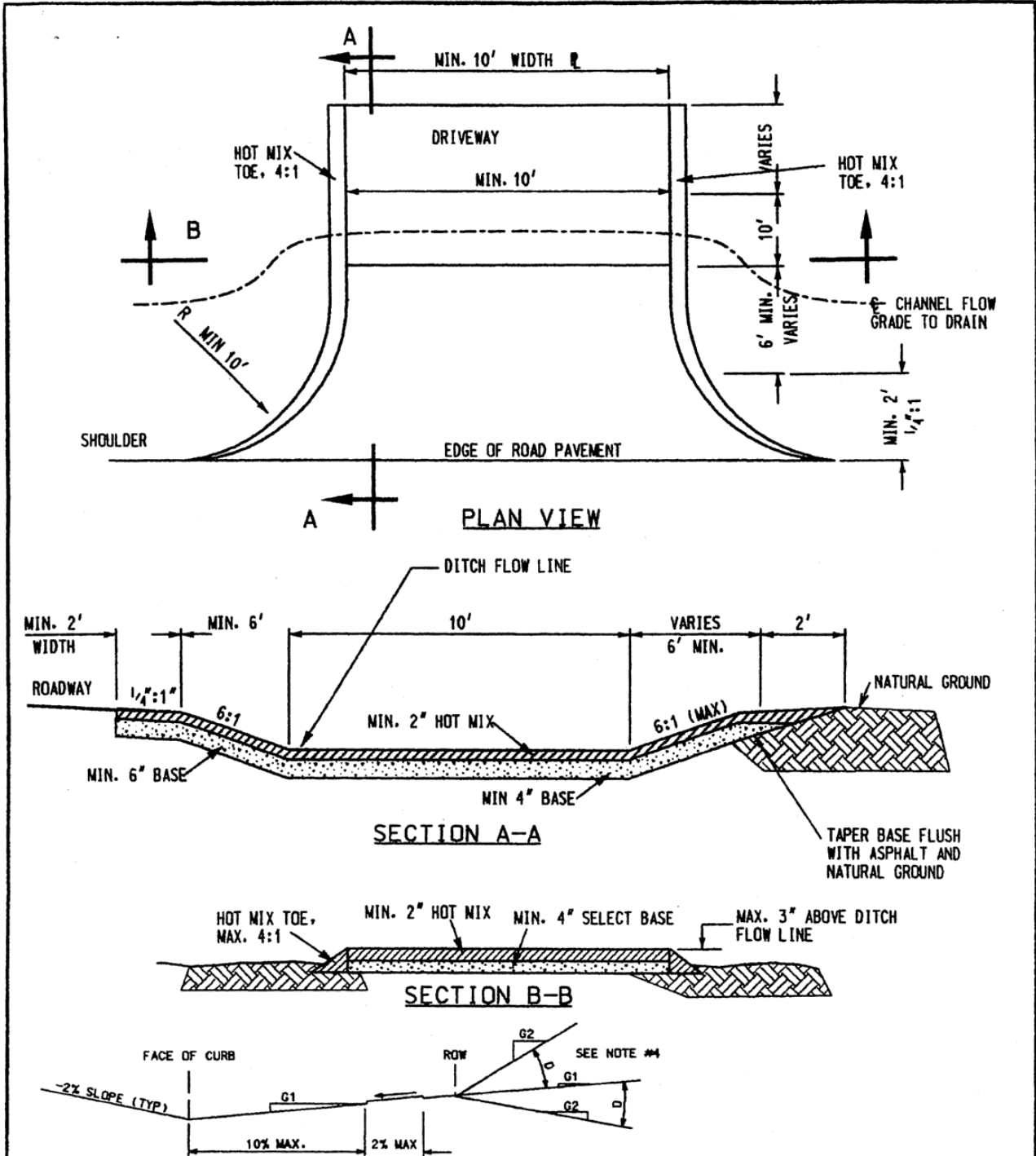
PLAN



SECTION

- NOTES:
- A. 6" MIN. COVER.
 - B. 5" CONCRETE RIP-RAP WITH 6"x6" #10 W.W.M. SHALL BE INSTALLED.
 - C. PIPE SIZE AND NUMBER TO BE DESIGNATED BY CITY ENGINEER.
 - D. 6" CONCRETE WITH #4 BARS @ 18" C-C MAY BE INSTALLED IN LIEU OF ASPHALT PVMT. WHERE APPROPRIATE, OR AS DIRECTED BY CITY.

VILLAGE OF BEAR CREEK, TEXAS		
Scale: NTS	DRIVEWAY WITH CULVERT PIPE	Drawn by: RPW
FIGURE 4		



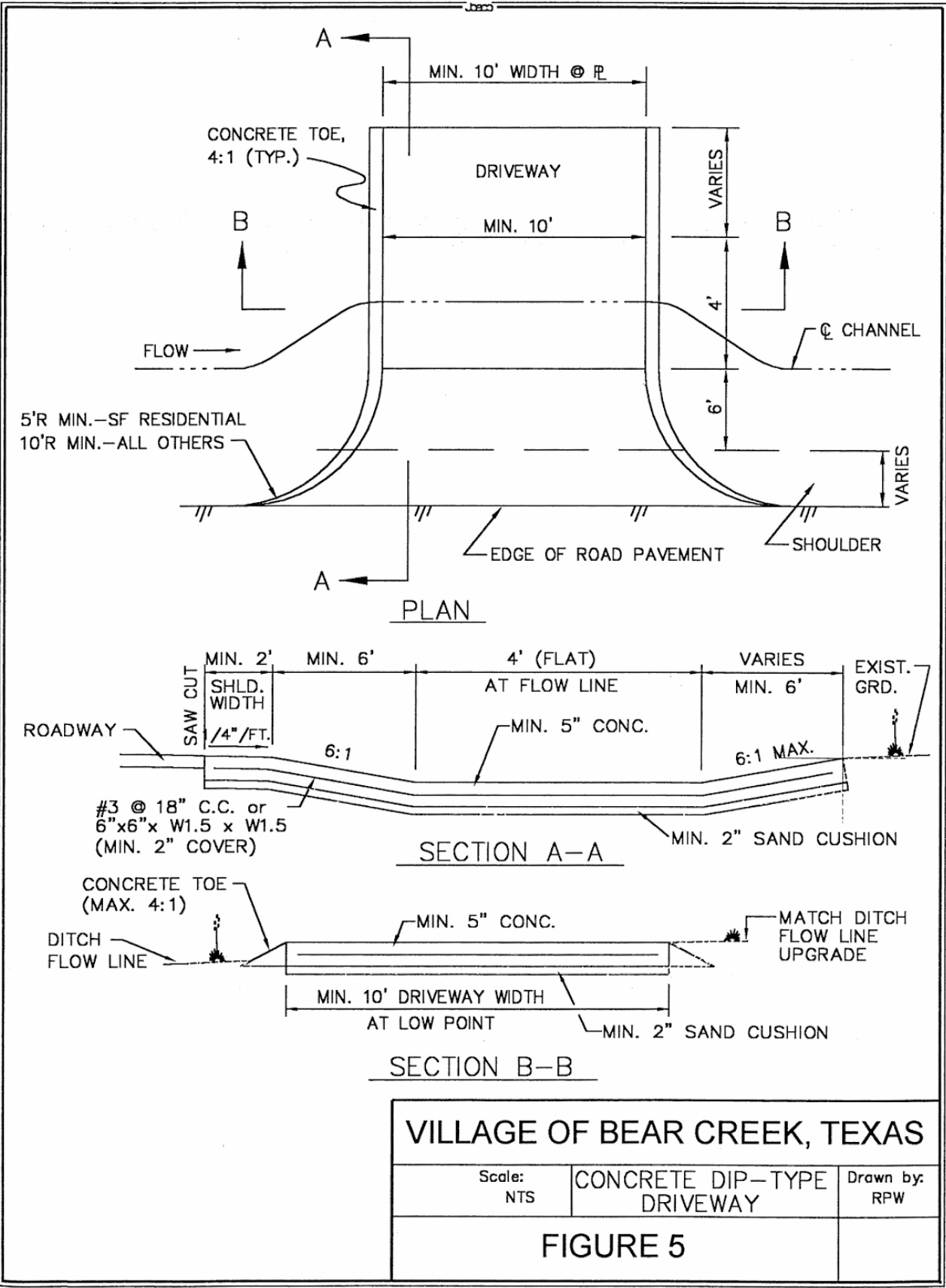
NOTES:

1. USE AS DESIGNED WITH DITCH GRADE FROM 0% TO 3%.
2. ADD DITCH RETARD AT 10' UPGRADE OF DRIVE WITH DITCH GRADE OF 4% TO 6%. SEE FIGURE 9.10.
3. USE CONCRETE DIP-TYPE DRIVEWAY AT DITCH GRADES OVER 6%.
4. WHILE THE PROPERTY OWNER REMAINS RESPONSIBLE FOR GRADE BREAKS WITHIN PRIVATE PROPERTY, THE FIRE DEPARTMENT SHOULD BE CONSULTED WHERE THE DRIVEWAY IS ESSENTIAL TO EMERGENCY VEHICLE ACCESS AND "G2" IS GREATER THAN 15%.

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82.302B

ASPHALT DIP-STYLE DRIVEWAY	
DETAIL NO.: FIGURE 9.1	DATE: 08/20/97
SOURCE: TNR	SCALE: N.T.S.
PATHNAME: \\M:\CADDATA\MAT\PI\BROOK\82-302B.DWG	VERT: HORIZ:



VILLAGE OF BEAR CREEK, TEXAS		
Scale: NTS	CONCRETE DIP-TYPE DRIVEWAY	Drawn by: RPW
FIGURE 5		

ADOPTED AND APPROVED on this _____ day of _____, 2018.

THE CITY OF THE VILLAGE OF BEAR CREEK, TEXAS

ATTEST:

Bruce Upham, Mayor

ATTEST:

Kathyrn Rosenbluth, City Secretary