TABLE 5.—*Estimated soil properties significant to engineering*

[Absence of data indicates that properties are too variable for valid estimates. The symbol < means less than]

Soil series and map symbols	Hydrologic group	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage less than 3 inches passing sieve—: No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity: Uncoated steel	Corrosivity: Concrete
		In				*Pct*					*Pct*		*In/hr*	*In/in of soil*	*pH*			
Alum: AmB, AmC	B	0–28	Loamy fine sand	SM or SP–SM or SM–SC	A–2–4, A–3	0–10	90–100	90–100	60–95	7–30	<25	[1]NP–7	2.0–6.0	0.05–0.10	6.1–6.5	Low	Low	Moderate.
		28–48	Sandy clay	CL or CH	A–7	0–10	90–100	90–100	90–100	51–85	44–53	22–30	0.06–0.20	0.15–0.18	5.6–6.5	Moderate	High	Moderate.
		48–55	Sandy clay loam	CL	A–6 or A–7	0–10	90–100	90–100	80–90	51–65	29–45	15–25	0.06–0.20	0.15–0.18	5.1–6.0	Moderate	Moderate	Moderate.
		55–65	Sandy clay loam	CL or SC	A–6, A–7, or A–4	0–15	90–100	90–100	65–85	36–55	25–45	8–25	0.06–0.60	0.15–0.17	5.1–6.0	Moderate	Moderate	Moderate.
Aransas: Ar, As	D	0–75	Clay	CH	A–7	0	100	100	95–100	70–90	51–65	30–40	<0.06	0.15–0.18	7.9–9.0	High	High	Low.
Clareville: CaA, CaB	C	0–10	Clay loam	CL or SC	A–6, A–7	0	98–100	95–100	95–100	45–65	32–48	15–27	0.60–2.0	0.12–0.20	6.6–7.8	Moderate	High	Low.
		10–38	Clay loam	CL or CH	A–7	0	98–100	95–100	95–100	51–65	46–60	25–37	0.2–0.60	0.15–0.20	6.6–8.4	Moderate	High	Low.
		38–65	Clay loam, sandy clay loam.	CL or CH	A–6, A–7	0	98–100	90–100	90–98	51–60	36–52	17–30	0.60–2.0	0.12–0.16	7.4–8.4	Moderate	High	Low.
Colibro: ClB, ClC	B	0–16	Sandy clay loam	CL or CL–ML	A–4 or A–6	0–5	95–100	95–100	85–100	51–90	20–35	5–15	2.0–6.0	0.10–0.15	7.9–8.4	Low	Moderate	Low.
		16–48	Loam and fine sandy loam.	CL or SC or CL–ML or SM–SC	A–4	0–5	95–100	95–100	85–95	40–65	20–30	5–10	2.0–6.0	0.10–0.15	7.9–8.4	Low	Moderate	Low.
		48–60	Loamy fine sand	SM or SM–SC	A–2–4 or A–4	0–5	95–98	90–95	80–90	15–49	<25	NP–7	2.0–6.0	0.09–0.14	7.9–8.4	Low	Moderate	Low.
Coy: CoA, CoB	D	0–12	Clay loam	CL	A–7 or A–6	0	98–100	97–100	95–100	70–85	35–45	18–25	0.20–0.60	0.15–0.20	7.9–8.4	Moderate	High	Low.
		12–65	Clay	CL or CH	A–7–6	0	98–100	97–100	95–100	75–90	45–60	29–40	<0.06	0.14–0.18	7.9–8.4	High	High	Low.
Crockett: CrA, CrB, CrC2	D	0–10	Fine sandy loam	SM or ML	A–4 or A–2–4	0	95–100	95–100	95–100	30–55	<25	NP–3	0.60–2.0	0.13–0.17	5.6–7.3	Low	High	Low.
		10–35	Clay loam	CH or CL	A–7–6	0	95–100	95–100	95–100	65–80	45–55	25–35	<0.06	0.14–0.18	5.6–7.8	High	High	Low.
		35–62	Sandy clay loam	CL	A–6, A–7	0	95–100	95–100	90–100	55–75	30–45	10–30	0.06–0.20	0.10–0.13	6.6–8.4	Low	High	Low.
Elmendorf: EdA, EdB (Elmendorf part)	D	0–16	Clay loam	CL	A–6, A–7	0–2	95–100	90–100	90–100	64–90	30–50	15–28	0.20–0.60	0.15–0.20	6.6–8.4	Moderate	High	Low.
		16–50	Clay and clay loam	CH or CL	A–7–6	0–2	95–100	90–100	90–100	70–95	45–65	25–40	<0.06	0.15–0.20	7.4–8.4	High	High	Low.
EdA, EdB (Denhawken part)	D	0–14	Clay loam	CL, CH	A–6, A–7	0–2	95–100	90–100	90–100	65–90	35–55	16–33	0.20–0.60	0.15–0.20	7.9–8.4	Moderate	High	Low.
		14–75	Clay loam and shaly clay loam.	CH or CL	A–7–6	0–2	95–100	90–100	85–100	70–95	44–68	25–43	<0.06	0.14–0.18	7.9–8.4	High	High	Low.
Eufaula: EPB (Eufaula part)	A	0–4	Loamy fine sand	SM	A–2–4	0	100	100	90–98	13–30	------	NP	6.0–20.0	0.04–0.06	5.6–7.3	Low	Low	Moderate.
		4–80	Fine sand	SM–SP, SM	A–3, A–2–4	0	100	100	85–99	9–20	<25	NP–3	6.0–20.0	0.04–0.06	5.1–6.5	Low	Low	Moderate.
EPB (Patilo part)	C	0–54	Fine sand	SM or SP–SM or SM–SC	A–2–4	0	100	95–100	90–100	8–20	<25	NP–6	0.60–2.0	0.05–0.08	5.6–7.3	Very low	Low	Moderate.
		54–85	Sandy clay loam	SC	A–6, A–4, or A–2–4, A–2–6	0	90–100	90–100	90–100	25–50	25–35	11–20	0.20–0.60	0.14–0.18	5.1–6.0	Low	Low	Moderate.
Floresville: FoA, FoB, FoC, FoC2	C	0–10	Fine sandy loam	SM or SC SM–SC	A–2 or A–4	0–5	93–100	91–100	60–98	25–49	<25	NP–10	0.60–2.0	0.10–0.15	6.1–7.3	Low	Low	Low.
		10–30	Sandy clay and clay	CL, CH	A–6 or A–7	0–5	95–100	95–100	80–97	51–75	35–55	30–35	0.06–0.20	0.15–0.18	6.1–7.8	Moderate	High	Low.
		30–65	Sandy clay loam	SC or CL	A–6, A–7	0–5	95–100	95–100	70–94	36–60	25–50	15–30	0.20–0.60	0.10–0.16	7.4–8.4	Moderate	Moderate	Low.
Gowen: Go, Gz (Gowen part)	B	0–40	Clay loam	CL	A–6	0	100	100	85–100	60–80	30–40	11–25	0.6–2.0	0.15–0.20	6.1–7.3	Moderate	Moderate	Low.
		40–60	Clay loam	CL	A–6 or A–4	0	100	100	85–100	55–80	25–40	10–25	0.6–2.0	0.15–0.20	6.6–8.4	Moderate	Moderate	Low.
Gz (Zavala part)	B	0–60	Loam or fine sandy loam.	SM or SC or CL or ML, CL–ML, SM–SC	A–2 or A–4	0	100	100	85–98	30–60	20–26	2–10	2.0–6.0	0.11–0.16	6.1–7.8	Low	Low	Low.
Karnes: KaB	B	0–62	Loam or fine sandy loam.	SM–SC, SC, CL, CL–ML	A–4 or A–6	0–5	95–100	95–100	85–100	36–60	20–35	5–15	2.0–6.0	0.10–0.15	7.9–8.4	Low	Moderate	Low.
Kaufman: Kf	D	0–28	Clay	CH	A–7	0	100	100	95–100	90–95	70–75	40–50	<0.06	0.15–0.20	6.6–7.8	Very high	Very high	Low.
		28–60	Clay	CH	A–7	0	100	100	95–100	90–95	75–85	45–55	<0.06	0.15–0.20	7.4–7.8	Very high	Very high	Low.

TABLE 5.—*Estimated soil properties significant to engineering*—Continued

Soil series and map symbols	Hydrologic group	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage less than 3 inches passing sieve—: No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity: Uncoated steel	Corrosivity: Concrete
		In				*Pct*					*Pct*		*In/hr*	*In/in of soil*	*pH*			
Leming: LeB	C	0–22	Loamy fine sand	SM-SC or SM	A-2	0	95–100	95–100	50–75	20–35	20–30	2–6	2.0–6.0	0.05–0.10	6.1–7.3	Very low	High	Low.
		22–48	Sandy clay	CL or SC	A-6 or A-7	0	95–100	95–100	85–95	45–60	35–45	15–30	0.06–0.20	0.15–0.20	6.1–8.4	Moderate	High	Low.
		48–62	Sandy clay loam	CL or SC	A-6	0–10	95–100	95–100	85–95	45–60	30–40	11–20	0.60–2.0	0.14–0.18	6.6–8.4	Moderate	High	Low.
Loire:																		
Lf (Loire part)	B	0–16	Silty clay loam	CL	A-4 or A-6	0	95–100	80–100	75–95	70–90	30–40	9–25	0.60–2.0	0.16–0.19	7.9–8.4	Low	Moderate	Low.
		16–80	Loam, fine sandy loam	SC or CL	A-4 or A-6	0	95–100	80–100	75–95	45–75	20–35	8–15	0.60–2.0	0.16–0.19	7.9–8.4	Low	Moderate	Low.
Lf (Frio part)	B	0–60	Silty clay loam, silty clay.	CL	A-6 or A-7-6	0–20	65–100	65–100	60–100	55–95	35–50	20–30	0.20–0.60	0.15–0.22	7.9–8.4	Moderate	High	Low.
Luling: LuB	D	0–70	Clay, shaly clay	CH	A-7-6	0	95–100	90–100	70–100	60–95	51–65	30–45	<0.06	0.15–0.20	6.6–8.4	High	High	Low.
Marcelinas: MaB	D	0–12	Clay loam	CL	A-6	0–1	98–100	95–100	90–100	70–90	30–40	15–25	0.2–0.60	0.15–0.20	6.6–8.4	Moderate	Moderate	Low.
		12–28	Clay	CH or CL	A-7-6	0–1	98–100	95–100	90–100	70–90	45–60	21–35	<0.06	0.14–0.18	7.4–8.4	High	High	Low.
		28–48	Clay loam	CL	A-7-6	0–4	95–100	90–100	85–100	75–85	41–49	18–27	<0.06	0.15–0.20	7.9–8.4	Moderate	High	Low.
		48–72	Sandy clay loam	CL	A-7, A-6	0–6	90–100	80–95	70–95	51–75	30–48	11–25	0.20–0.60	0.12–0.16	7.9–8.4	Moderate	Moderate	Low.
Miguel: MgA, MgB, MgC, MgC2	D	0–11	Fine sandy loam	SM or SM-SC	A-2-4, A-4	0	100	95–100	90–100	15–36	<25	NP–6	2.0–6.0	0.10–0.15	6.1–7.3	Low	High	Low.
		11–33	Sandy clay, clay	CL or SC or CH	A-6 or A-7-6	0	100	95–100	90–100	45–70	40–55	20–31	<0.06	0.14–0.17	6.6–7.8	Moderate	High	Low.
		33–60	Sandy clay loam	CL or SC	A-6 or A-7-6	0	95–100	90–100	90–100	40–70	30–48	15–32	0.06–0.20	0.12–0.15	7.9–8.4	Low	High	Low.
Nocken:																		
NKC (Nocken part)	C	0–8	Fine sandy loam	SC or SM-SC or GC or GM-GC	A-2-4 or A-4	5–40	60–85	40–85	35–65	20–49	20–30	4–10	0.60–2.0	0.03–0.10	5.6–7.3	Low	Low	Moderate
		8–30	Sandy clay	CL or SC or GC	A-6, A-7	5–55	60–80	45–80	40–75	36–70	30–45	18–25	0.20–0.60	0.04–0.12	5.1–6.5	Low	High	Moderate
		30–37	Sandy clay loam	CL or SC or GC	A-6	5–55	60–85	45–80	40–75	36–65	30–40	18–22	0.20–0.60	0.03–0.11	4.5–6.5	Low	High	Moderate
		37–40	Weakly cemented sandstone.															
NKC (Rock outcrop part).																		
Orthents, rolling: OgD3.																		
Picosa: PcC	C	0–6	Loam	CL	A-6	0–8	85–95	80–95	60–80	51–65	25–35	11–20	0.60–2.0	0.10–0.15	7.4–8.4	Low	Moderate	Low.
		6–15	Weakly consolidated sandstone and shale.															
Poth: PrB	C	0–30	Loamy fine sand	SM or SM-SC	A-2-4 or A-4	0	98–100	98–100	60–95	20–40	<25	NP–6	2.0–6.0	0.07–0.11	6.1–7.8	Low	Low	Low.
		30–60	Sandy clay loam	CL or SC	A-7	0	98–100	95–100	85–95	45–60	41–50	20–30	0.60–0.20	0.15–0.19	6.1–8.4	Moderate	High	Low.
		60–74	Loam	CL or SC	A-4, A-6	0	90–100	90–100	65–90	45–55	25–35	10–20	0.60–2.0	0.10–0.16	6.1–8.4	Low	Moderate	Low.
Rosanky: RsB, RsC	C	0–14	Fine sandy loam	SM or SM-SC	A-2-4 or A-4	0–2	80–90	75–85	75–85	32–42	20–27	2–5	0.60–2.0	0.08–0.11	5.6–6.5	Very low	Moderate	Moderate
		14–37	Clay	CL	A-6 or A-7	0–2	85–100	85–100	80–100	62–72	38–48	20–26	0.20–0.60	0.11–0.17	5.1–6.0	Moderate	Moderate	Moderate
		37–55	Sandy clay loam	SC, CL, CL-ML, SM-SC	A-4 or A-6	0	85–100	85–100	80–100	36–60	30–40	5–19	0.20–0.60	0.10–0.16	5.1–6.0	Low	Moderate	Moderate
Runge: RuA, RuB, RuC	B	0–12	Fine sandy loam	SM-SC or SM	A-2-4, A-4	0	100	95–100	95–100	25–45	<25	NP–7	2.0–6.0	0.11–0.16	6.1–7.8	Low	Moderate	Low.
		12–47	Sandy clay loam, sandy clay.	SC or CL	A-6, A-4	0	100	95–100	95–100	45–65	22–36	8–18	0.60–2.0	0.14–0.20	6.6–8.4	Low	Moderate	Low.
		47–60	Loam	SM or SM-SC	A-2-4, A-4	0	100	95–100	95–100	25–45	20–30	3–7	0.60–2.0	0.12–0.14	7.9–8.4	Low	Moderate	Low.
Sarita: SaC	A	0–54	Fine sand	SM	A-2-4	0	100	100	65–80	20–35	<25	NP–3	6.0–20.0	0.05–0.08	6.1–7.3	Low	Low	Low.
		54–90	Sandy clay loam and loam.	SC	A-2-6, A-6	0	100	100	80–90	30–50	30–40	15–25	2.0–6.0	0.12–0.16	6.6–8.4	Moderate	Low	Moderate
Sauparaeo: SpB, SpC	B	0–50	Fine sandy loam	SC or SM-SC	A-4	0–5	95–100	90–100	80–90	36–50	20–30	5–10	2.0–6.0	0.10–0.15	7.9–8.4	Low	Low	Low.
		50–62	Loamy fine sand	SM or SM-SC	A-2-4 or A-4	0–5	95–98	90–95	65–80	15–40	<25	NP–7	2.0–6.0	0.05–0.10	7.9–8.4	Low	Low	Low.
Tabor: TbB	D	0–17	Loamy fine sand	SM-SC or SM	A-2-4	0	85–100	75–100	50–75	15–30	<25	NP–6	2.0–6.0	0.07–0.11	5.1–6.5	Low	Low	Moderate
		17–56	Clay, sandy clay	CH	A-7	0	95–100	95–100	90–100	60–90	51–60	25–45	<0.06	0.14–0.18	5.1–7.8	High	High	High.
		56–62	Sandy clay loam	CH, CL, SC	A-7, A-6	0	95–100	95–100	75–100	45–90	35–60	25–35	<0.06	0.14–0.18	5.6–7.8	High	High	Moderate

TABLE 5.—*Estimated soil properties significant to engineering*—Continued

Soil series and map symbols	Hydrologic group	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage less than 3 inches passing sieve—: No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity: Uncoated steel	Corrosivity: Concrete
		In				*Pct*					*Pct*		*In/hr*	*In/in of soil*	*pH*			
Tordia: TrA, TrB	D	0–44	Clay	CH	A-7-6	0–2	95–100	95–100	90–100	75–90	50–65	30–45	<0.06	0.14–0.18	7.4–8.4	High	High	Low.
		44–60	Shale.															
Udochrepts, shallow: Us	C	0–8	Clay loam	CL	A-6	0–2	98–100	95–100	90–100	70–85	30–40	18–25	0.20–0.60	0.15–0.20	7.4–7.8	Moderate	High	Low.
		8–18	Clay	CH	A-7-6	0–4	95–100	95–100	90–100	75–90	50–65	30–45	0.06–0.20	0.15–0.20	7.4–7.8	High	High	Low.
		18–25	Weathered sandstone and shale.															
Venus: VeA, VeB	B	0–18	Clay loam	CL or CL-ML	A-4 or A-6	0	100	95–100	85–100	50–75	20–40	5–18	0.60–2.0	0.15–0.20	7.9–8.4	Low	High	Low.
		18–48	Clay loam	CL or CL-ML	A-4 or A-6	0	95–100	95–100	85–100	50–75	20–40	5–18	0.60–2.0	0.15–0.20	7.9–8.4	Low	High	Low.
		48–62	Loam	SC or SM-SC or CL or CL-ML	A-4 or A-6	0	80–100	70–100	65–100	40–75	20–40	5–18	0.60–2.0	0.15–0.18	7.9–8.4	Low	High	Low.
Vernia: VrC	A	0–50	Very gravelly loamy sand.	GP-GM	A-1	5–10	15–40	15–34	10–15	6–10	----	NP	6.0–20.0	0.03–0.05	6.1–7.8	Low	Low	Low.
		50–84	Very gravelly sandy clay loam.	GC or SC	A-2-6 or A-2-7	2–5	30–65	13–60	13–60	13–31	35–45	18–30	0.06–2.0	0.08–0.13	5.1–6.5	Low	Moderate	Moderate.
Wilco: WcB, WcC, WcC2	C	0–16	Loamy fine sand	SM or SM-SC	A-2-4	0	95–100	95–100	80–97	13–30	<26	NP–6	2.0–6.0	0.07–0.10	5.6–6.5	Low	Low	Low.
		16–32	Sandy clay	CL or CH	A-7-6	0	95–100	95–100	80–100	51–65	43–52	25–31	0.06–0.20	0.15–0.18	5.6–7.8	Moderate	High	Moderate.
		32–38	Sandy clay loam	SC or CL	A-6 or A-7	0	95–100	95–100	80–100	36–60	39–48	20–30	0.20–0.60	0.10–0.13	6.6–8.4	Moderate	Moderate	Low.
		38–60	Fine sandy loam	SC or CL	A-6 or A-7 or A-2-6	0	95–100	90–100	80–100	30–60	30–45	15–25	0.20–0.60	0.10–0.12	6.6–8.4	Moderate	Moderate	Low.
Willamar: WmA	D	0–7	Fine sandy loam	SM or ML or SM-SC or CL-ML	A-4	0	100	100	100	36–70	20–35	1–7	0.6–2.0	0.15–0.18	6.1–7.8	Low	Very high	Moderate.
		7–32	Sandy clay loam	CL	A-6	0	100	100	100	50–70	25–35	15–25	<0.06	0.06–0.09	7.4–8.4	Moderate	Very high	Moderate.
		32–60	Loam	CL	A-6	0	100	100	100	50–70	25–35	15–25	0.06–0.20	0.06–0.09	7.9–9.0	Moderate	Very high	Moderate.
Yahola:																		
YkE (Yahola part)	B	0–60	Fine sandy loam	SM or ML or CL-ML or SM-SC	A-2 or A-4	0	100	100	85–95	30–60	<26	NP–6	2.0–6.0	0.11–0.16	7.9–8.4	Low	Low	Low.
		60–80	Loamy fine sand	SM	A-2	0	100	100	90–98	13–30	----	NP	2.0–6.0	0.07–0.11	7.9–8.4	Low	Low	Low.
YkE (Karnes part)	B	0–62	Loam or fine sandy loam.	SM-SC, SC, CL, CL-ML	A-4 or A-6	0–5	95–100	95–100	85–100	36–60	20–35	5–15	2.0–6.0	0.10–0.15	7.9–8.4	Low	Moderate	Low.
Zavala: Za, Zf	B	0–60	Fine sandy loam	SM or SC or CL or ML, CL-ML, SM-SC	A-2 or A-4	0	100	100	85–98	30–60	20–26	2–10	2.0–6.0	0.11–0.16	6.1–7.8	Low	Low	Low.

[1] NP=Nonplastic.