1-CONTACTS, KEY BEDS, AND DIKES

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
TIET INO	DESCRIPTION	1.1 – Contacts	CARTOGRAM THO OF LOW TOATIONS	140 120 ON 00AGE
1.1.1	Contact—Identity and existence certain, location accurate		lineweight .15 mm	
1.1.2	Contact—Identity or existence questionable, location accurate	?	→ .75 mm → 12.0 mm ←	
1.1.3	Contact—Identity and existence certain, location approximate		3.5 mm → ←	
1.1.4	Contact—Identity or existence questionable, location approximate		→	
1.1.5	Contact—Identity and existence certain, location inferred		1.5 mm → ←	
1.1.6	Contact—Identity or existence questionable, location inferred	?	→	
1.1.7	Contact—Identity and existence certain, location concealed		.5 mm ≯ ←	
1.1.8	Contact—Identity or existence questionable, location concealed	<u>?</u>		
1.1.9	Internal contact—Identity and existence certain, location accurate		lineweight .15 mm .25 mm	Use to delineate individ- ual debris flows, land- slide blocks, alluvial
1.1.10	Internal contact—Identity or existence questionable, location accurate	?	→ 10.0 mm k	fans, etc., within the same geologic map unit.
1.1.11	Internal contact—Identity and existence certain, location approximate		4.0 mm .25 mm → -	
1.1.12	Internal contact—Identity or existence questionable, location approximate	?	.5 mm .5 mm	
1.1.13	Internal contact—Identity and existence certain, location inferred		2.0 mm .25 mm	
1.1.14	Internal contact—Identity or existence questionable, location inferred	?	.5 mm .5 mm	
1.1.15	Internal contact—Identity and existence certain, location concealed		.75 mm .25 mm ⇒ k-	
1.1.16	Internal contact—Identity or existence questionable, location concealed	?		
1.1.17	Gradational contact—Identity and existence certain, location accurate		hachure lineweight .15 mm .4 mm H -8 H	Use to indicate a gradu- al or continuous litho- logic change from one
1.1.18	Gradational contact—Identity or existence questionable, location accurate	?	→ ← 7.23 mm	geologic map unit to an- other.
1.1.19	Gradational contact—Identity and existence certain, location approximate	1111111 1111111 11111111 11111111	.4 mm ⇒ ← 	
1.1.20	Gradational contact—Identity or existence questionable, location approximate	?	2.0 mm < 2.0 mm	
1.1.21	Gradational contact—Identity and existence certain, location inferred	11111 11111 11111 11111 11111	.4 mm, → - 	
1.1.22	Gradational contact—Identity or existence questionable, location inferred	?	→ ← → ← 2.0 2.0 mm mm	
1.1.23	Gradational contact—Identity and existence certain, location concealed		.4 mm, → - ?	
1.1.24	Gradational contact—Identity or existence questionable, location concealed	?	→ ← → ← 2.0 2.0 mm mm	

1-CONTACTS, KEY BEDS, AND DIKES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*	
	1.1—Contacts (continued)				
1.1.25	Unconformable contact—Identity and existence certain, location accurate	···········	lineweight lineweight .15 mm	May be used to show paraconformaties or disconformaties. Not in-	
1.1.26	Unconformable contact—Identity or existence questionable, location accurate	······	12.0 mm	tended for use to show angular unconformities or nonconformities.	
1.1.27	Unconformable contact—Identity and existence certain, location approximate	www.	3.5 mm > k	Boundary of geologic map unit is center line (solid or dashed), not "sine-wave"-style line.	
1.1.28	Unconformable contact—Identity or existence questionable, location approximate	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Sille-wave -style lille.	
1.1.29	Unconformable contact—Identity and existence certain, location inferred	44444444	1.5 mm		
1.1.30	Unconformable contact—Identity or existence questionable, location inferred	AAAAAJAAAAA	→ → ← .75 mm		
1.1.31	Unconformable contact—Identity and existence certain, location concealed	wwwww	5 mm * + *********************************		
1.1.32	Unconformable contact—Identity or existence questionable, location concealed	www.			
1.1.33	Incised-scarp sedimentary contact—Identity and existence certain, location accurate. Hachures point downscarp		all lineweights .15 mm 2.0 mm H-8 → ← 1.0	Use to show where a younger surficial geologic unit has been de-	
1.1.34	Incised-scarp sedimentary contact—Identity or existence questionable, location accurate. Hachures point downscarp	<u> </u>	75 → 12.0 mm mm	posited on an erosional scarp that has been in- cised into an older surfi- cial geologic unit.	
1.1.35	Incised-scarp sedimentary contact—Identity and existence certain, location approximate. Hachures point downscarp		3.5 mm → ke	olai geologio unit.	
1.1.36	Incised-scarp sedimentary contact—Identity or existence questionable, location approximate. Hachures point downscarp	?	≯ ← ≯ ← .75 mm		

^{*}For more information, see general guidelines on pages A-i to A-v.

1-CONTACTS, KEY BEDS, AND DIKES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*		
	1.2-Key beds					
1.2.1	Key bed—Identity and existence certain, location accurate		lineweight .2 mm	Use to show key beds that are too narrow to map as an area at map scale. Add name of geologic map unit if more than one type of key bed is shown on map (see Section 1.4). May also be shown in color.		
1.2.2	Key bed—Identity or existence questionable, location accurate	?	75 mm → 12.0 mm ←			
1.2.3	Key bed—Identity and existence certain, location approximate		3.5 mm → ←			
1.2.4	Key bed—Identity or existence questionable, location approximate		→ - → - - → - - 75 mm 75 mm			
1.2.5	Key bed—Identity and existence certain, location inferred		1.5 mm → -			
1.2.6	Key bed—Identity or existence questionable, location inferred		≯ ← ≯ ← .75 mm .75 mm			
1.2.7	Key bed—Identity and existence certain, location concealed		.5 mm ≯ ←			
1.2.8	Key bed—Identity or existence questionable, location concealed	····?	→ \< → \< .75 mm .75 mm			
1.2.9	Clay bed—Identity and existence certain, location accurate		lineweight .3 mm color 100% green HB-8 (100% green)	Use to show clay beds that are too narrow to map as an area at map		
1.2.10	Clay bed—Identity or existence questionable, location accurate	?	→ .75 mm → 12.0 mm <-	scale. Add name if more than one type is shown on		
1.2.11	Clay bed—Identity and existence certain, location approximate		3.5 mm → + 2	map (see Section 1.4). May also be shown in black or other colors.		
1.2.12	Clay bed—Identity or existence questionable, location approximate		→ → -75 mm .75 mm			
1.2.13	Clay bed—Identity and existence certain, location inferred		1.5 mm → k -			
1.2.14	Clay bed—Identity or existence questionable, location inferred		≯ ← ≯ ← .75 mm .75 mm			
1.2.15	Clay bed—Identity and existence certain, location concealed		.5 mm ≯ ←			
1.2.16	Clay bed—Identity or existence questionable, location concealed		커논 커논 .75 mm .75 mm			
1.2.17	Bed of economically important commodity—Identity and existence certain, location accurate		lineweight .3 mm /HB-8	Use to show such eco- nomically important beds as gypsum, salt,		
1.2.18	Bed of economically important commodity—Identity or existence questionable, location accurate	?	.75 mm → 12.0 mm ←	bentonite, phosphate, or limestone that are too narrow to map as		
1.2.19	Bed of economically important commodity—Identity and existence certain, location approximate		3.5 mm → ←	an area at map scale. Do not use to show coal beds (see Section 1.2, ref. nos. 1.2.25-40).		
1.2.20	Bed of economically important commodity—Identity or existence questionable, location approximate			Add name of commodity if more than one type is shown on map (see		
1.2.21	Bed of economically important commodity—Identity and existence certain, location inferred		1.5 mm ⇒ ←	Section 1.4). May also be shown in color.		
1.2.22	Bed of economically important commodity—Identity or existence questionable, location inferred	?	: -> k> k .75 mm .75 mm			
1.2.23	Bed of economically important commodity—Identity and existence certain, location concealed		.5 mm ≯l←			
1.2.24	Bed of economically important commodity—Identity or existence questionable, location concealed		≯ ← ≯ ← .75 mm			

1—CONTACTS, KEY BEDS, AND DIKES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
		1.2-Key beds (continue	ed)	
1.2.25	Coal bed—Identity and existence certain, location accurate		lineweight .3 mm color 100% red HB-8 (100% red)	Use to show coal beds that are too narrow to map as an area at map
1.2.26	Coal bed—Identity or existence questionable, location accurate	 ?	→ .75 mm → 12.0 mm ←	Add name if more than one type is shown on
1.2.27	Coal bed—Identity and existence certain, location approximate		3.5 mm → ←	map (see Section 1.4). May also be shown in black or other colors.
1.2.28	Coal bed—Identity or existence questionable, location approximate	-	→ 	
1.2.29	Coal bed—Identity and existence certain, location inferred		1.5 mm → ←	
1.2.30	Coal bed—Identity or existence questionable, location inferred		≯ ← ≯ ← .75 mm	
1.2.31	Coal bed—Identity and existence certain, location concealed		.5 mm ≯ 	
1.2.32	Coal bed—Identity or existence questionable, location concealed		≯k- ≯k- .75 mm	
1.2.33	Clinkered coal bed—Identity and existence certain, location accurate	·····	.375 mm H-8 (100% red) .375 mm 90°/	Use to show clinkered coal beds that are too narrow to map as an
1.2.34	Clinkered coal bed—Identity or existence questionable, location accurate	····	.8 mm → ← lineweight .2 mm color 100% red	area at map scale. Tops of V's follow trace of bed; V's point down-
1.2.35	Clinkered coal bed—Identity and existence certain, location approximate	~~~ ~~~ ~~~ ~~~	.375 mm → ←	ward stratigraphically. Add name if more than one type is shown on map (see Section 1.4).
1.2.36	Clinkered coal bed—Identity or existence questionable, location approximate	~~~ ~~~?~~~ ~~~	→ k → k 2.0 2.0 mm mm	May also be shown in black or other colors.
1.2.37	Clinkered coal bed—Identity and existence certain, location inferred	~~ ~~ ~~ ~~	.375 mm → <	
1.2.38	Clinkered coal bed—Identity or existence questionable, location inferred	~~ ~~?~~ ~~	y	
1.2.39	Clinkered coal bed—Identity and existence certain, location concealed	V V V V V		
1.2.40	Clinkered coal bed—Identity or existence questionable, location concealed			
1.2.41	Area of clinkered coal bed	14, 77, 77	contact [lineweight .15 mm]	Add name if more than one type is shown on map (see Section 1.4).
1.2.42	Outcrop area of key bed or bed of economically important commodity (1st option)	-:4	scratch 50 100% black boundary [lineweight 0.0]	Outcrop areas may either overprint other geo logic map units or be
1.2.43	Outcrop area of key bed or bed of economically important commodity (2nd option)	2.2	scratch 50 yandary [lineweight 0.0]	used as stand-alone geologic map units. Each type of outcrop
1.2.44	Outcrop area of clay bed	-4	scratch boundary [lineweight 0.0]	area may also be shown in other values of black or in other col- ors; add name(s) if
1.2.45	Outcrop area of coal bed	4	scratch boundary [lineweight 0.0]	more than one type is shown on map (see Section 1.4).

*For more information, see general guidelines on pages A-i to A-v.

1-CONTACTS, KEY BEDS, AND DIKES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*		
	1.3-Dikes					
1.3.1	Dike (1st option)—Identity and existence certain, location accurate		color 100% red lineweight .25 mm	Use when dike is too narrow to show as an area at map scale.		
1.3.2	Dike (1st option)—Identity and existence certain, location approximate		3.5 mm →	Add map-unit labels to dikes if needed (see Section 1.4); use a		
1.3.3	Dike (2nd option)—Identity and existence certain, location accurate	++++++++	color 100% red $\frac{1}{\sqrt{1.25}} \frac{1.25 \text{ mm}}{\sqrt{1.25 \text{ mm}}}$ lineweight .25 mm	queried label if identity of dike is questionable. May also be shown in black or other colors.		
1.3.4	Dike (2nd option)—Identity and existence certain, location approximate	+++++++	3.5 mm →	black of other colors.		
1.3.5	Dike (3rd option)—Identity and existence certain, location accurate	* * * * *	color 100% red 90° \times \times \times \times \times \times \uparrow \uparrow \uparrow 1.0 mm lineweight .25 mm			
1.3.6	Dike (3rd option)—Identity and existence certain, location approximate	* * * * *	3.5 mm			
1.3.7	Dike (4th option)—Identity and existence certain, location accurate	••••	color 100% red dot diameter 1.125 mm lineweight .25 mm dot diameter 1.125 mm			
1.3.8	Dike (4th option)—Identity and existence certain, location approximate		3.5 mm → k- → k- → k- .75 mm			
1.3.9	Dike (5th option)—Identity and existence certain, location accurate	0000	color 100% red circle diameter 1.175 mm lineweight .25 mm circle diameter 1.175 mm 4.25 mm			
1.3.10	Dike (5th option)—Identity and existence certain, location approximate		3.5 mm 			
1.3.11	Dike (6th option)—Identity and existence certain, location accurate	••••	1.125 mm 1.125 mm			
1.3.12	Dike (6th option)—Identity and existence certain, location approximate	****	3.5 mm →			
1.3.13	Dike of variable thickness	+++		Although only "dike (2nd option)" is shown here, any type of dike		
1.3.14	Dike intruding fault (1st option)		fault [lineweight	symbol may be used. Add map-unit labels to dikes if needed (see		
1.3.15	Dike intruding fault (2nd option)		contact [lineweight .15 mm]	Section 1.4). Thick dikes may also be shown in other colors.		

^{*}For more information, see general guidelines on pages A-i to A-v.

1—CONTACTS, KEY BEDS, AND DIKES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
		tions and notations for	contacts, key beds, and dikes	
	Inclined contact, dike, key bed, clay bed, coal bed,	35	tick length35 ← HI-6	Line-symbol decora-
1.4.1	or bed of economically important commodity (1st option)—Showing dip value and direction	<u>_</u>	1.75 mm; lineweight .15 mm	tions may be added to any type or style of con-
	Inclined contact, dike, key bed, clay bed, coal bed,	15	tick length15 ± .875 mm	tact, as well as to any type or style of key bed
1.4.2	or bed of economically important commodity (2nd option)—Showing dip value and direction		lineweight 30°	or dike (use proper line- weights, etc., to show
	Vertical or near-vertical contact, dike, key bed, clay		tick length	clay beds, coal beds,
1.4.3	bed, coal bed, or bed of economically important commodity (1st option)		lineweight .15 mm	dikes, etc.). Place tick, arrow, or oth-
1.4.4	Vertical or near-vertical contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (2nd option)	90	90 ← HI-6	er line-symbol decoration where observation was made.
1.4.5	Overturned contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (1st option)—Showing dip value and direction		tick length 85 ← HI-6 1.75 mm; Ineweight 625 mm 1.15 mm radius	Add arrowhead or '90' to ticks showing dip if necessary for clarity.
	Overturned contact, dike, key bed, clay bed, coal	75	tick length 75 t 075	
1.4.6	bed, or bed of economically important commodity (2nd option)—Showing dip value and direction		.15 mm radius 30°	
	Lineation on surface of contact, dike, key bed, clay	√ 65	6.0 mm √65 ← HI-6 lineweight	
1.4.7	bed, coal bed, or bed of economically important commodity—Showing bearing and plunge		25°/ → 1.5 mm	
	Lineation on surface of inclined contact, dike, key bed,	²⁵ 7 35	tick length HI-6→25 ▼35	
1.4.8	Lineation on surface of inclined contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity — Tick shows contact dip value and direction; arrow shows bearing and plunge of lineation		lineweight .15 mm	
	Contact—Showing relative age of intrusive or extru-	Υ	H-7 → Y	
1.4.9	sive units where known: Y, younger; O, older	0	H-7-70	
1.4.10	Contact—Showing location where contact is particularly well exposed in field		\\\/20°\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
1.4.11	Key bed, clay bed, coal bed, bed of economically important commodity, or dike—Showing thickness and location where measured	1.5 ¥	1.5 ← H-6	Use proper lineweights, etc., to show clay beds, coal beds, dikes, etc.
1.4.12	Key bed – Showing name	ds	ds	
1.4.13	Clay bed—Showing name	sc	——————————————————————————————————————	
1.4.14	Bed of economically important commodity— Showing name	gyp	gyp ^{HI-8}	
1.4.15	Coal bed—Showing name	lg	lgHI-8 (100% black)	
1.4.16	Clinkered coal bed—Showing name	~~~~m~~~~	∠HI-8 (100% black)	
1.4.17	Area of clinkered coal bed—Showing name	6977	HI-8 (100% D97 A J black) (2571257)	
1.4.18	Dike—Showing name	Km	Km ^{<-} H-8 leader lineweight .175 mm	Although only "dike (2nd option)" is shown labeled here, map-unit
1.4.19	Dike of variable thickness—Showing name	KJd KJd?	KJd←H-8→KJd? leader lineweight .175 mm	labels may be added to any type of dike symbol. Use a queried map-unit
1.4.20	Dike intruding fault (1st option)—Showing name	Km	Km [∠] H-8 leader lineweight .175 mm	label if identity of dike is questionable.
1.4.21	Dike intruding fault (2nd option)—Showing name	Td	H-8 > Td	

^{*}For more information, see general guidelines on pages A-i to A-v.