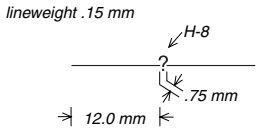
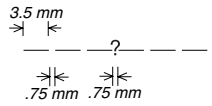
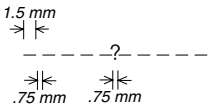
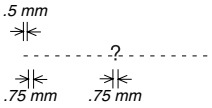
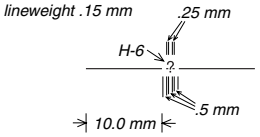
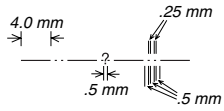
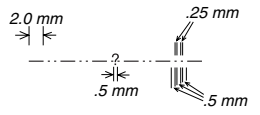
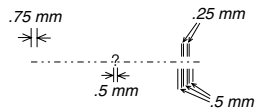
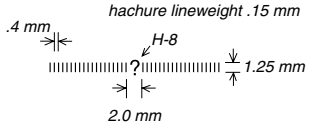
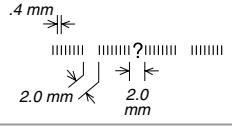
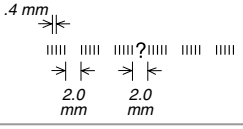
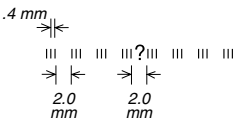
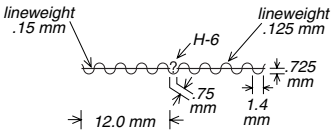
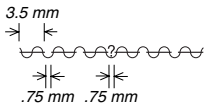
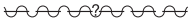
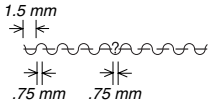
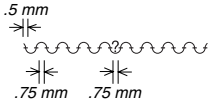
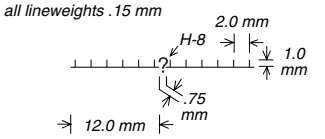
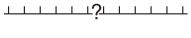
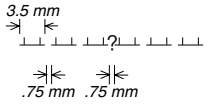
1—CONTACTS, KEY BEDS, AND DIKES

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
	1.1—Contacts			
1.1.1	Contact—Identity and existence certain, location accurate			
1.1.2	Contact—Identity or existence questionable, location accurate	?—		
1.1.3	Contact—Identity and existence certain, location approximate			
1.1.4	Contact—Identity or existence questionable, location approximate	?—		
1.1.5	Contact—Identity and existence certain, location inferred			
1.1.6	Contact—Identity or existence questionable, location inferred	?—		
1.1.7	Contact—Identity and existence certain, location concealed			
1.1.8	Contact—Identity or existence questionable, location concealed	?		
1.1.9	Internal contact—Identity and existence certain, location accurate			Use to delineate individual debris flows, landslide blocks, alluvial fans, etc., within the same geologic map unit.
1.1.10	Internal contact—Identity or existence questionable, location accurate	?		
1.1.11	Internal contact—Identity and existence certain, location approximate			
1.1.12	Internal contact—Identity or existence questionable, location approximate	?		
1.1.13	Internal contact—Identity and existence certain, location inferred			
1.1.14	Internal contact—Identity or existence questionable, location inferred	?		
1.1.15	Internal contact—Identity and existence certain, location concealed			
1.1.16	Internal contact—Identity or existence questionable, location concealed	?		
1.1.17	Gradational contact—Identity and existence certain, location accurate			Use to indicate a gradual or continuous lithologic change from one geologic map unit to another.
1.1.18	Gradational contact—Identity or existence questionable, location accurate	?		
1.1.19	Gradational contact—Identity and existence certain, location approximate			
1.1.20	Gradational contact—Identity or existence questionable, location approximate	?		
1.1.21	Gradational contact—Identity and existence certain, location inferred			
1.1.22	Gradational contact—Identity or existence questionable, location inferred	?		
1.1.23	Gradational contact—Identity and existence certain, location concealed			
1.1.24	Gradational contact—Identity and existence questionable, location concealed	?		

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*
	1.1—Contacts (continued)			
1.1.25	Unconformable contact—Identity and existence certain, location accurate			May be used to show paraconformaties or disconformaties. Not intended for use to show angular unconformities or nonconformities. Boundary of geologic map unit is center line (solid or dashed), not "sine-wave"-style line.
1.1.26	Unconformable contact—Identity or existence questionable, location accurate			
1.1.27	Unconformable contact—Identity and existence certain, location approximate			
1.1.28	Unconformable contact—Identity or existence questionable, location approximate			
1.1.29	Unconformable contact—Identity and existence certain, location inferred			
1.1.30	Unconformable contact—Identity or existence questionable, location inferred			
1.1.31	Unconformable contact—Identity and existence certain, location concealed			
1.1.32	Unconformable contact—Identity or existence questionable, location concealed			
1.1.33	Incised-scarp sedimentary contact—Identity and existence certain, location accurate. Hachures point downscarp			Use to show where a younger surficial geologic unit has been deposited on an erosional scarp that has been incised into an older surficial geologic unit.
1.1.34	Incised-scarp sedimentary contact—Identity or existence questionable, location accurate. Hachures point downscarp			
1.1.35	Incised-scarp sedimentary contact—Identity and existence certain, location approximate. Hachures point downscarp			
1.1.36	Incised-scarp sedimentary contact—Identity or existence questionable, location approximate. Hachures point downscarp			

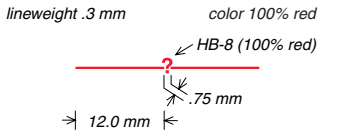
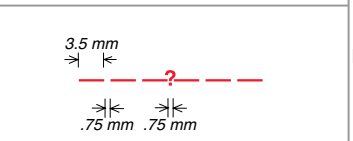
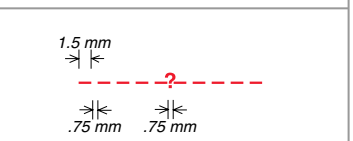
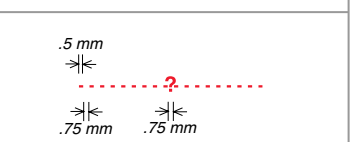
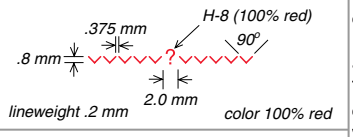
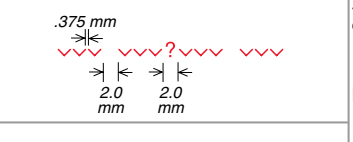
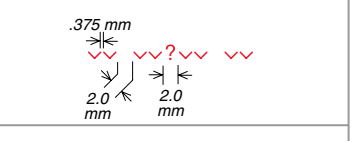
**For more information, see general guidelines on pages A-i to A-v.*

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; H-8; .75 mm; 12.0 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	?		
1.2.3	Key bed—Identity and existence certain, location approximate		3.5 mm; .75 mm; .75 mm	
1.2.4	Key bed—Identity or existence questionable, location approximate	?		
1.2.5	Key bed—Identity and existence certain, location inferred		1.5 mm; .75 mm; .75 mm	
1.2.6	Key bed—Identity or existence questionable, location inferred	?		
1.2.7	Key bed—Identity and existence certain, location concealed		.5 mm; .75 mm; .75 mm	
1.2.8	Key bed—Identity or existence questionable, location concealed	?		
1.2.9	Clay bed—Identity and existence certain, location accurate		lineweight .3 mm; color 100% green; HB-8 (100% green); .75 mm; 12.0 mm	Use to show clay beds that are too narrow to map as an area at map scale. Add name if more than one type is shown on map (see Section 1.4). May also be shown in black or other colors.
1.2.10	Clay bed—Identity or existence questionable, location accurate	?		
1.2.11	Clay bed—Identity and existence certain, location approximate		3.5 mm; .75 mm; .75 mm	
1.2.12	Clay bed—Identity or existence questionable, location approximate	?		
1.2.13	Clay bed—Identity and existence certain, location inferred		1.5 mm; .75 mm; .75 mm	
1.2.14	Clay bed—Identity or existence questionable, location inferred	?		
1.2.15	Clay bed—Identity and existence certain, location concealed		.5 mm; .75 mm; .75 mm	
1.2.16	Clay bed—Identity or existence questionable, location concealed	?		
1.2.17	Bed of economically important commodity—Identity and existence certain, location accurate		lineweight .3 mm; HB-8; .75 mm; 12.0 mm	Use to show such economically important beds as gypsum, salt, bentonite, phosphate, or limestone that are too narrow to map as an area at map scale. Do not use to show coal beds (see Section 1.2, ref. nos. 1.2.25-40). Add name of commodity if more than one type is shown on map (see Section 1.4). May also be shown in color.
1.2.18	Bed of economically important commodity—Identity or existence questionable, location accurate	?		
1.2.19	Bed of economically important commodity—Identity and existence certain, location approximate		3.5 mm; .75 mm; .75 mm	
1.2.20	Bed of economically important commodity—Identity or existence questionable, location approximate	?		
1.2.21	Bed of economically important commodity—Identity and existence certain, location inferred		1.5 mm; .75 mm; .75 mm	
1.2.22	Bed of economically important commodity—Identity or existence questionable, location inferred	?		
1.2.23	Bed of economically important commodity—Identity and existence certain, location concealed		.5 mm; .75 mm; .75 mm	
1.2.24	Bed of economically important commodity—Identity or existence questionable, location concealed	?		

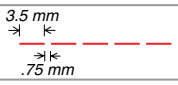
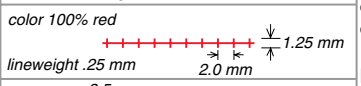
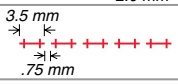
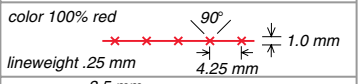
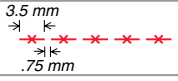
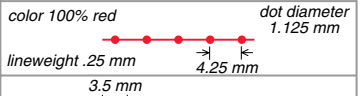
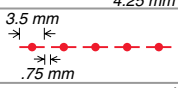
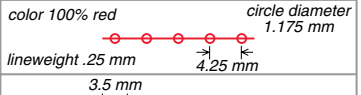
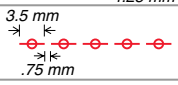
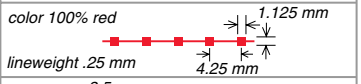
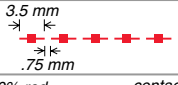
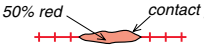
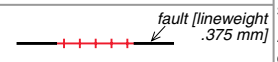
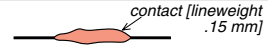
*For more information, see general guidelines on pages A-i to A-v.

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

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
	1.2—Key beds (continued)			
1.2.25	Coal bed—Identity and existence certain, location accurate			Use to show coal beds that are too narrow to map as an area at map scale. Add name if more than one type is shown on map (see Section 1.4). May also be shown in black or other colors.
1.2.26	Coal bed—Identity or existence questionable, location accurate			
1.2.27	Coal bed—Identity and existence certain, location approximate			
1.2.28	Coal bed—Identity or existence questionable, location approximate			
1.2.29	Coal bed—Identity and existence certain, location inferred			
1.2.30	Coal bed—Identity or existence questionable, location inferred			
1.2.31	Coal bed—Identity and existence certain, location concealed			
1.2.32	Coal bed—Identity or existence questionable, location concealed			
1.2.33	Clinkered coal bed—Identity and existence certain, location accurate			Use to show clinkered coal beds that are too narrow to map as an area at map scale. Tops of V's follow trace of bed; V's point downward stratigraphically. Add name if more than one type is shown on map (see Section 1.4). May also be shown in black or other colors.
1.2.34	Clinkered coal bed—Identity or existence questionable, location accurate			
1.2.35	Clinkered coal bed—Identity and existence certain, location approximate			
1.2.36	Clinkered coal bed—Identity or existence questionable, location approximate			
1.2.37	Clinkered coal bed—Identity and existence certain, location inferred			
1.2.38	Clinkered coal bed—Identity or existence questionable, location inferred			
1.2.39	Clinkered coal bed—Identity and existence certain, location concealed			
1.2.40	Clinkered coal bed—Identity or existence questionable, location concealed			
1.2.41	Area of clinkered coal bed			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)			Outcrop areas may either overprint other geologic map units or be used as stand-alone geologic map units. Each type of outcrop area may also be shown in other values of black or in other colors; add name(s) if more than one type is shown on map (see Section 1.4).
1.2.43	Outcrop area of key bed or bed of economically important commodity (2nd option)			
1.2.44	Outcrop area of clay bed			
1.2.45	Outcrop area of coal bed			

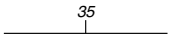
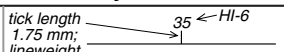
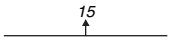
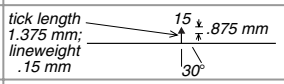
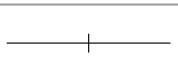
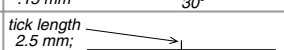
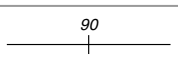
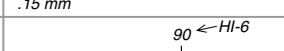
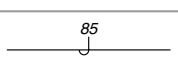
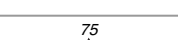
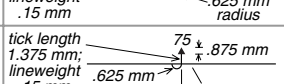
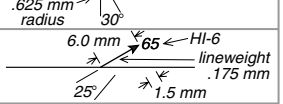
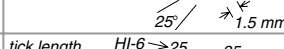
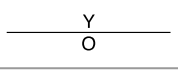
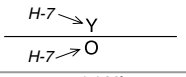
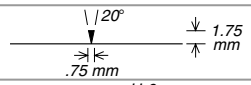
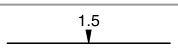
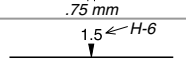
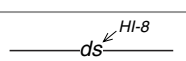
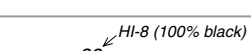
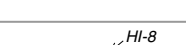
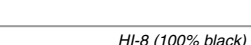
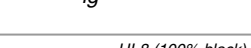
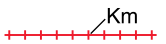
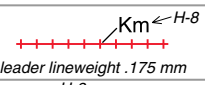
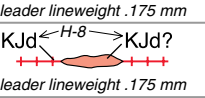
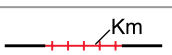
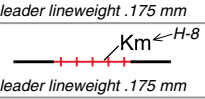
For more information, see general guidelines on pages A-i to A-v.

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			Use when dike is too narrow to show as an area at map scale. Add map-unit labels to dikes if needed (see Section 1.4); use a queried label if identity of dike is questionable. May also be shown in black or other colors.
1.3.2	Dike (1st option)—Identity and existence certain, location approximate			
1.3.3	Dike (2nd option)—Identity and existence certain, location accurate			
1.3.4	Dike (2nd option)—Identity and existence certain, location approximate			
1.3.5	Dike (3rd option)—Identity and existence certain, location accurate			
1.3.6	Dike (3rd option)—Identity and existence certain, location approximate			
1.3.7	Dike (4th option)—Identity and existence certain, location accurate			
1.3.8	Dike (4th option)—Identity and existence certain, location approximate			
1.3.9	Dike (5th option)—Identity and existence certain, location accurate			
1.3.10	Dike (5th option)—Identity and existence certain, location approximate			
1.3.11	Dike (6th option)—Identity and existence certain, location accurate			
1.3.12	Dike (6th option)—Identity and existence certain, location approximate			
1.3.13	Dike of variable thickness			Although only "dike (2nd option)" is shown here, any type of dike symbol may be used. Add map-unit labels to dikes if needed (see Section 1.4). Thick dikes may also be shown in other colors.
1.3.14	Dike intruding fault (1st option)			
1.3.15	Dike intruding fault (2nd option)			

**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*
1.4—Line-symbol decorations and notations for contacts, key beds, and dikes				
1.4.1	Inclined contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (1st option)—Showing dip value and direction			Line-symbol decorations may be added to any type or style of contact, as well as to any type or style of key bed or dike (use proper lineweights, etc., to show clay beds, coal beds, dikes, etc.). Place tick, arrow, or other line-symbol decoration where observation was made. Add arrowhead or '90' to ticks showing dip if necessary for clarity.
1.4.2	Inclined contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (2nd option)—Showing dip value and direction			
1.4.3	Vertical or near-vertical contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (1st option)			
1.4.4	Vertical or near-vertical contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (2nd option)			
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			
1.4.6	Overturned contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity (2nd option)—Showing dip value and direction			
1.4.7	Lineation on surface of contact, dike, key bed, clay bed, coal bed, or bed of economically important commodity—Showing bearing and plunge			
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			
1.4.9	Contact—Showing relative age of intrusive or extrusive units where known: Y, younger; O, older			
1.4.10	Contact—Showing location where contact is particularly well exposed in field			
1.4.11	Key bed, clay bed, coal bed, bed of economically important commodity, or dike—Showing thickness and location where measured			Use proper lineweights, etc., to show clay beds, coal beds, dikes, etc.
1.4.12	Key bed—Showing name			
1.4.13	Clay bed—Showing name			
1.4.14	Bed of economically important commodity—Showing name			
1.4.15	Coal bed—Showing name			
1.4.16	Clinkered coal bed—Showing name			
1.4.17	Area of clinkered coal bed—Showing name			
1.4.18	Dike—Showing name			Although only "dike (2nd option)" is shown labeled here, map-unit labels may be added to any type of dike symbol. Use a queried map-unit label if identity of dike is questionable.
1.4.19	Dike of variable thickness—Showing name			
1.4.20	Dike intruding fault (1st option)—Showing name			
1.4.21	Dike intruding fault (2nd option)—Showing name			

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