

## **Appendix B**

### **Planimetric and Topographic Feature Depiction Specifications**

This appendix contains guidance for depicting planimetric and topographic features based on the specified target scale. It is intended to consistently define the amount of feature density and detail required for a given scale, given the digitizing capabilities of a stereoplotter operating at that scale. Unique project-specific features not normally or routinely encoded (usually because of the extra cost thereof) must be independently identified and scheduled in a contract as a “special mapping requirement.” These specifications are shown below and have been developed for the nominal target scales shown in each section. They may be expanded to cover the scale ranges shown. These specifications were developed by Atlantic Aerial Surveys, Huntsville, AL, a member of the Management Association for Private Photogrammetric Surveyors. A data content standard is also a critical part of a successful geospatial data product such as Geographic Information Systems (GIS) mapping and Engineering mapping. A data content standard provides semantic definitions for a set of real world geographic objects of significance to a community. The Spatial Data Standards for Facilities, Infrastructure and Environment (SDS for FIE) provides a dictionary of standard feature and attribute definitions as well as a physical data model. The SDS for FIE is compliant with the Federal Geographic Data Committee (FGDC) standards. Generally, planimetric and topographic feature collection for Corps of Engineers projects and most other Federal agency projects undertaken by the Corps of Engineers shall be in full compliance with the current version of the SDS for FIE. Also attached to Appendix C is an Excel spreadsheet that maps features as shown below to the SDS for FIE.

#### *Section I*

##### *Feature Depiction Specifications*

*Nominal Scale: 50 Feet per Inch*

*Target Scale Range: 20 to 60 Feet per Inch*

### **B-1. Transportation**

#### **Abandoned Railroad**

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact (the line will be patterned to represent two rails 5 ft apart).

#### **Bridge**

Structure erected over obstacle or depression. “Bridge” includes automotive bridges, railroad bridges, foot-bridges, and viaducts. Continue all depictions across bridge, including edge of paved road and guardrail, if the item continues on the bridge. Do not contour bridges.

#### **Curb**

Raised edge defining edge of pavement, parking lot islands, etc. Curbs have precedence over edge of pavement lines. Retaining walls have precedence over curbs. Contours should run unbroken along curbs (do not snap to each side).

#### **Concrete Barrier**

Short wall erected between traffic lanes. Digitize center line of barrier.

#### **Guardrail**

Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guardrails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail. For concrete barriers, use ornamental wall symbology.

**Paint Stripe (Special Request Only)**

Digitize center line of stripes. Digitize outlines of very wide stripes and arrows, etc.

**Parking Bumper (Special Request Only)**

Temporary structure, usually concrete, used to delineate parking. Digitize edge of bumper.

**Paved Parking**

Digitize edge of pavement of parking lot and parking lot islands. Six-inch curb and retaining wall have precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

**Path**

Visible, permanent dirt trail less than 6 ft wide, used commonly for bikes or pedestrian traffic. Digitize center line of path. Every element has precedence over trail.

**Paved Drive**

Define by edge of pavement. Paved drive has precedence over unpaved road or drive, sidewalk, and slab. Paved road and retaining wall have precedence over paved drive. Paved shoulder should join cleanly with paved drive.

**Paved Road**

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

**Paved Shoulder**

Pavement between edge of paved road and edge of total paved surface. Curb and guardrail have precedence over shoulder. Paved shoulder has precedence over sidewalk or slab, and should be broken for paved drives and parking lots. Do not show unpaved shoulders.

**Pavement Change**

Delineate change of pavement only between macadam and concrete surfaces. Do not show change between old and new asphalt, road repairs, etc.

**Railroad**

Digitize center line of all rails in use (the line will be patterned to represent two rails 5 ft apart). Show all sidings and spurs (tracks for storage, etc.).

**Retaining Wall (Major)**

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over curb, fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

**Runway**

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown with unpaved road symbology.

**Sidewalk**

Show edges of all sidewalks, public or private. Sidewalk should not continue across paved drives unless it does so visibly on photography. Paved drive, parking lot, and road have precedence over sidewalk. Sidewalk has precedence over unpaved drive or parking lot and slab. Show steps (if requested) as miscellaneous structures.

### **Trail (Vehicular)**

Dirt passageway that is permanent in nature and wider than 6 ft. Trails are not maintained as well as dirt roads; field roads shall be shown as trails. All transportation features have precedence over trails.

### **Unpaved Drive**

Paved shoulder should not stop for unpaved drive. Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

### **Unpaved Parking**

Do not open paved shoulder for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

### **Unpaved Road**

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Unpaved road edge has precedence over unpaved drive or parking lot. Where unpaved road intersects a paved surface, the edge of pavement line has precedence, including slabs or sidewalks. Also use unpaved road for unpaved runways.

## **B-2. Structures**

### **Area Under Construction**

Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction and any feature that has been completed (e.g., curb or completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

### **Athletic Field**

Outline field only if not depicted by fence or slab. Show permanent basketball goals, football goal posts, etc., as miscellaneous posts. Do not show tennis court nets or posts for tennis court nets. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

### **Broadcast Antenna**

Radio or television tower. Digitize center of tower.

### **Building**

"Building" includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc., as part of the building. Do not show common roof lines (e.g., between townhomes) or interior roof lines (e.g., dormers). All buildings are to end at the mapping contract boundary. Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings, if free-standing.

### **Cemetery**

Delineate cemetery boundary only if not bounded by a fence line. Show paved and unpaved drives and buildings. Do not show headstones or sidewalks. Label "CEMETERY."

### **Dam**

Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also. Label "DAM."

**Debris**

Scattered and unsorted material covering ground. Digitize outline of area and label "DEBRIS." Do not contour.

**Fence**

Digitize center lines of all visible fences. Do not differentiate between fence and gate. If gate closes across road, pull fence across road. Do not show individual fence posts.

**Field Line (Special Request Only)**

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

**Flagpole**

Digitize center of pole. Look for slab at base.

**Golf Course**

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, sand traps, or flags except upon special request. Show all paved and unpaved drives (cart paths) that are permanent in nature. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

**Jetty**

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

**Levee**

Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

**Mail Box**

Digitize center of mail box. Do not differentiate between collection boxes and delivery boxes.

**Miscellaneous Circle**

Unidentifiable circular item, such as gas filler cap. Do not label. Digitize center of item.

**Miscellaneous Feature**

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

**Miscellaneous Post**

Pole greater than 6 ft in height, including basketball goals and unidentifiable poles. Digitize center of post.

**Miscellaneous Square**

Unidentifiable square item, such as a corrugated metal valve cover; do not label. Digitize center of item.

**Miscellaneous Structure**

Minor buildings (air conditioner, tool storage shed, loading dock, deck, structures within substations, etc.). Do not label.

**Ornamental Wall**

Fixed structure of concrete or brick not used for retention of earth (if constructed of wood, delineate as fence). Digitize center line of wall. Ornamental wall has precedence over fence or cemetery. If wall is used solely as a sign (as in front of a business), delineate as a postless sign.

**Pier**

Deck supported by posts extended over water. Digitize edge of pier. Label "PIER."

**Pipeline**

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter usually found near industrial areas or public utilities plants. Digitize edge; label "PIPE." Do not show supporting structures. Do not show pipes that do not touch the ground, such as between buildings.

**Pool**

Digitize interior edge of concrete around inground pools, and center line of walls in aboveground pools. Label "POOL." Also use "POOL" for aeration pools in industrial areas. Pool has precedence over slab and sidewalk symbology.

**Quarry**

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

**Residential Retaining Wall (Minor)**

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line and pattern so ticks are on high side of wall. Minor retaining wall has precedence over curb, fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

**Riprap**

Rocks placed along slopes to lessen erosion. Outline riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent nonpermanent irregular surface.

**Ruin or Under Construction Building**

Delineate all visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

**Silo**

Cylindrical receptacle for farm product storage. Outline and label "SILO," or "SILOS," if grouped together.

**Satellite Dish**

Digitize center of commercial and private satellite dishes. Do not show satellite dishes on top of buildings. Broadcast antenna has precedence over satellite dish.

**Slab**

Any miscellaneous concrete slab, such as a flagpole base or concrete around swimming pool. Also use slab for patio. If slab is imbedded in a paved surface, outline as change of pavement. Slab has precedence over unpaved road.

**Storage**

Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area and label "STORAGE." Do not contour piled areas or areas stacked so that the ground is not visible. Retaining wall symbology takes precedence over storage outline. Outline junkyards with storage line and label "JUNKYARD."

**Tank**

Outline public utility tanks and industrial storage tanks. Show small propane tanks only if used for a business. Label "TANK," or "TANKS," if grouped together.

**Telephone Booth**

Digitize center of booth or pedestal.

**Underground Pipeline (Special Request Only)**

Digitize center line of apparent underground utility pipes. Label "U/G PIPE."

**B-3. Natural Features**

**Bush**

Single bush less than 8 ft tall. Digitize center of bush. If many bushes are aligned together, use hedge row symbology. Bush symbol does not reflect width of bush. Do not show single bushes within a brush line. Do not show groups of flowers that may be interspersed with decorative bushes.

**Brush**

Trees under 8 ft tall, shrubs, and tall weeds thickly massed, usually found near forested areas, in unpopulated meadows or lots, or near rivers or creeks. Brush line may also be used for bushes that are too densely grouped to digitize individually. Do not outline decorative bushes or bush rows with brush. Instead, use hedge row and plot lone bushes. Tree mass has precedence over brush. Brush adjacent to a wooded area should close neatly with tree mass outline.

**Creek**

Nonnavigable stream. Digitize shorelines of streams wider than 5 ft, and digitize center lines of streams narrower than 5 ft. Join creeks cleanly with rivers, lakes, or ponds. Do not pull tree mass lines across double-wide creeks.

**Hedge Row**

Row of bushes close together, usually neatly maintained. Digitize center line of bush row.

**Lake**

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

**Pond**

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

**River**

Navigable stream. Digitize shorelines.

**Swamp**

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

**Tree**

Single tree over 8 ft tall (except upon special request). Digitize center of base of tree trunk. No distinction is made between deciduous and coniferous trees. Tree symbol does not reflect extent of tree canopy. Do not plot single trees within a tree mass outline.

### **Tree Canopy (Special Request Only)**

Digitize center of trunk and place canopy to show extent of branches.

### **Tree Mass**

Group of trees too close together to allow individual plotting. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature (e.g., vehicular trail, creek over 5 ft wide) or any railroad line, regardless of canopy spread. Tree mass has precedence over brush.

## **B-4. Drainage Structures**

### **Circular Catch Basin**

Round drainage grating. Digitize center of catch basin. Do not label.

### **Concrete Headwall**

Concrete on the end of a transverse drain or pipe culvert. Digitize the center line of thin headwalls, such as those on ditches or under driveways. Digitize outer edge of thicker and larger headwalls. Headwalls have precedence over culvert symbology.

### **Culvert**

Pipe drain, usually located under roads or driveways. Digitize length of pipe from center of each end. Do not show culverts if cement headwalls are present.

### **Curb Inlet**

Drainage opening beneath a curb and interrupting the gutter. Frequently curb inlets have a manhole directly above them. Digitize center of curb inlet and orient symbol along the curb. Do not interrupt curb symbology.

### **Paved Ditch**

Digitize outer edge of paved ditch. Do not show water line inside ditch. Retaining wall has precedence over paved ditch. Paved ditch has precedence over sidewalk or slab. Cap ends or join cleanly with headwalls, if present.

### **Square Catch Basin**

Small rectangular or square drainage grate. Digitize center of catch basin. Do not label.

### **Unpaved Ditch**

Man-made channel for drainage. On planimetric maps, digitize the center line of all apparent ditches. On topographic maps, digitize the center line of ditches wider than 5 ft or if the ditches contain water.

## **B-5. Signs and Traffic Control**

### **Billboard**

Digitize center of each leg. Label "BB."

### **Double-Leg Sign**

Includes multileg signs and overhead signs. Digitize center of each leg. Label overhead signs "O/H."

### **Railroad Signal Pole**

Lights along rural tracks to guide trains or warning lights near track intersections with roads. Digitize center of post.

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### **Single-Leg Sign**

Digitize center of signpost. Orient face of sign to correspond to its true position, if identifiable.

### **Traffic Signal Pole**

Digitize center of post. Traffic signal symbology has precedence over light pole symbology if post has a dual purpose. Do not show signals suspended over roads.

## **B-6. Utilities**

### **Electric Box**

Digitize center of structure.

### **Fire Hydrant**

Digitize center of element.

### **Light Pole**

Pole supporting a street light. If the pole has power lines also, digitize as a power pole. Digitize the center of the light pole. Do not differentiate between street lights and parking lot lights.

### **Manhole**

A hole through which one can enter a sewer, conduit, etc. Manholes may be located on paved or unpaved surfaces. Digitize center of manhole.

### **Power Pole**

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole. Power pole has precedence over light pole if the pole has a dual purpose. Traffic signal pole has precedence over power pole.

### **Runway Light**

Digitize center of visible runway and taxiway lights. Do not show reflectors.

### **Substation**

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures. Substation outline has precedence over slab, unpaved drive, and trail. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

### **Transmission Tower**

Large structure for supporting power lines across long distances. Digitize base of tower.

### **Yard Light**

Very short lights, usually located around sidewalks at businesses or residences. Digitize center of light.

## **B-7. Contours**

*a.* Rules for contours (general) are listed:

(1) Break contours for (and do not contour) man-made structures that do not conform to the ground (e.g., buildings, retaining walls, bridges, etc.). Contours should join cleanly to these features.

(2) Do not contour active quarries, areas under construction, debris piles, or storage piles. Contours should join cleanly to these features.

## **B-8**



(3) Contours should turn back on single-line streams and should cross double-wide streams as a straight line from shore to shore.

*b.* Rules for depression contours. A depression is a contour that closes within the mapping limits (or obviously closes outside the mapping limits on the stereo model) such that the area enclosed by the contour is lower than the contour elevation. Depressions often occur around catch basins. If the contour turns back on a stream or ditch into a culvert or headwall, it is not a depression unless it closes on the other side of the culvert or headwall or under the road.

#### **Depressed Index Contour**

See paragraph B-7*b* above. Follow the same guidelines as for index contours.

#### **Depressed Intermediate Contour**

See *b* above. Follow the same guidelines as for intermediate contours.

#### **Hidden Depressed Index Contour**

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

#### **Hidden Depressed Intermediate Contour**

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

#### **Hidden Index Contour**

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

#### **Hidden Intermediate Contour**

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

#### **Index Contour**

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

#### **Index Contour Label**

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels, if necessary.

#### **Intermediate Contour**

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

#### **Spot Elevation**

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- a.* All road and/or railroad intersections.
- b.* At each end of bridges on center line of road.

- c. At center line of roads above culverts.
- d. At the highest point of closed contour tops.
- e. At the lowest point of closed depressions, significant saddles, and quarries.
- f. At points visible through dense vegetation in obscured areas.
- g. Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated to be parallel to the bottom of the sheets unless otherwise requested.

### **Water Elevation**

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

## **B-8. Manuscript Data**

### **Control Point**

Point used for both horizontal and vertical control. Place at coordinates and label.

### **Control Point Annotation**

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

### **Contour Limit Line**

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

### **Grid Annotation**

Place as appropriate. Use commas.

### **Grid Lines (Special Request Only)**

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

### **Grid Tick**

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

### **Horizontal Control Point**

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

### **Match Line**

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

### **Model Limit Line**

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

### **Standard Border**

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

### **Vertical Control Point**

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

### *Section II*

#### *Feature Depiction Specifications*

*Nominal Scale: 100 Feet per Inch*

*Target Scale Range: 80 to 160 Feet per Inch*

## **B-9. Transportation**

### **Abandoned Railroad**

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.

### **Bridge**

Structure erected over obstacle or depression. "Bridge" includes automotive bridges, railroad bridges, public footbridges, and viaducts. Continue all depictions across bridge, including edge of paved road and guardrail, if the item continues on the bridge. Do not contour bridges.

### **Concrete Barrier**

Short wall erected between traffic lanes. Digitize center line of barrier.

### **Guardrail**

Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guardrails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail. For concrete barriers, use ornamental wall symbology.

### **Path**

Visible, permanent dirt trail less than 8 ft wide, used commonly for bikes or pedestrian traffic. Digitize center line of path. Every element has precedence over path.

### **Paved Drive**

Define by edge of pavement. Paved drive has precedence over unpaved road, drive, sidewalk, and slab. Paved road and retaining wall have precedence over paved drive.

### **Paved Road**

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

### **Paved Parking**

Digitize edge of pavement of parking lot and parking lot islands. Retaining wall has precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

### **Railroad**

Digitize center line of all rails in use. Show all sidings and spurs (tracks for storage, etc.).

### **Retaining Wall (Major)**

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

### **Runway**

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown as unpaved roads.

### **Sidewalk**

Show edges of all public sidewalks. Sidewalk should not continue across paved drives unless it does so visibly on photography. Paved drive, parking lot, and road have precedence over sidewalk. Sidewalk has precedence over unpaved drive or parking lot and slab. Show no steps.

### **Trail (Vehicular)**

Dirt passageway that is permanent in nature and wider than 8 ft. Trails are not maintained as well as dirt roads; field roads shall be shown as trails. All transportation features have precedence over trails.

### **Unpaved Drive**

Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

### **Unpaved Parking**

Do not open paved surface for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

### **Unpaved Road**

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Unpaved road edge has precedence over unpaved drive or parking lot. Where unpaved road intersects a paved surface, the edge of pavement line has precedence, including slabs or sidewalks. Use unpaved road for unpaved runways.

## **B-10. Structures**

### **Area Under Construction**

Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction and any feature that has been completed (e.g., completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

### **Athletic Field**

Outline field only if not depicted by fence or slab. Do not show basketball goals, football goal posts, tennis court nets, or posts for tennis court nets. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

### **Broadcast Antenna**

Radio or television tower. Digitize center of tower.

### **Building**

“Building” includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc. as part of the building. Do not show common roof lines (e.g., between townhomes) or interior roof lines (e.g., dormers). All buildings are to end at the mapping contract boundary. Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings, if freestanding.

### **Cemetery**

Delineate cemetery boundary only if not bounded by a fence line. Show paved and unpaved drives and buildings. Do not show headstones or sidewalks. Label “CEMETERY.”

### **Commercial Satellite Dish**

Digitize center of commercial satellite dishes. Do not show satellite dishes on top of buildings. Broadcast antenna has precedence over satellite dish.

### **Dam**

Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also. Label “DAM.”

### **Debris (Greater than 10 ft H 10 ft)**

Scattered and unsorted material covering ground. Digitize outline of area and label “DEBRIS.” Do not contour.

### **Fence**

Digitize center lines of property line fences. Do not differentiate between fence and gate. If gate closes across road, pull fence across road. Do not show individual fence posts.

### **Field Line (Special Request Only)**

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

### **Flagpole**

Digitize center of identifiable public flagpoles.

### **Golf Course**

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, sand traps, or flags except upon special request. Show all paved and unpaved drives (cart paths) that are permanent in nature. Show all hydrology and natural features. Label “GOLF COURSE” with only enough frequency for identification.

### **Jetty**

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

### **Levee**

Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee on planimetric maps only (contours define levees on topographic maps). Label “LEVEE.”

### **Miscellaneous Circle**

Unidentifiable circular item, such as gas filler cap. Do not label. Digitize center of item.

**Miscellaneous Feature**

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

**Miscellaneous Square**

Unidentifiable square item, such as a corrugated metal valve cover. Do not label. Digitize center of item.

**Miscellaneous Structure**

Minor buildings (air conditioner, tool storage shed, loading dock, deck, structures within substations, etc.). Do not label.

**Ornamental Wall**

Fixed structure of concrete or brick not used for retention of earth (if constructed of wood, delineate as fence). Digitize center line of walls over 10 ft long. Ornamental wall has precedence over fence or cemetery. If wall is used solely as a sign (as in front of a business), delineate as a postless sign.

**Pier**

Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers behind residential homes. Label "PIER."

**Pipeline**

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize edge; label "PIPE." Do not show supporting structures. Do not show pipes that do not touch ground.

**Pool**

Digitize interior edge of concrete around inground pools. Label "POOL." Also use pool for aeration pools in industrial areas. Pool has precedence over slab and sidewalk symbology.

**Quarry**

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

**Residential Retaining Wall (Minor)**

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line of walls over 10 ft long and pattern so ticks are on high side of wall. Minor retaining wall has precedence over fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

**Riprap**

Rocks placed along slopes to lessen erosion. Outline riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent nonpermanent irregular surface.

**Ruin or Under Construction Building**

Delineate all visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

**Silo**

Large cylindrical receptacle for farm product storage. Label "SILO."

**Slab (Greater than 8 ft H 8 ft)**

Any miscellaneous concrete slab, such as a flagpole base or concrete around swimming pool. Slab has precedence over unpaved road.

**Storage (Greater than 10 ft H 10 ft)**

Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area and label "STORAGE." Do not contour piled areas or areas stacked so that the ground is not visible. Retaining wall symbology takes precedence over storage outline. Outline junkyards with storage line and label "JUNKYARD."

**Tank**

Public utility storage tank. Digitize edge of tank. Label "TANK."

**Underground Pipeline (Special Request Only)**

Digitize center line of apparent underground utility pipes. Label "U/G PIPE."

**B-11. Natural Features**

**Brush**

Trees under 10 ft tall, tall weeds, or other vegetation usually found in unpopulated meadows, near forested areas, rivers, or creeks. Outline brush only if it is dense enough to obscure ground. Tree mass outline has precedence over brush; brush adjacent to a wooded area should close cleanly to tree mass outline.

**Creek**

Nonnavigable stream. Digitize shorelines of streams wider than 10 ft, and digitize center lines of streams narrower than 10 ft. Join creeks cleanly with rivers, lakes, or ponds. Do not pull tree mass lines across double-wide creeks.

**Lake**

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

**Pond**

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

**River**

Navigable stream. Digitize shorelines.

**Swamp**

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

**Tree**

Single tree over 10 ft tall. Digitize center of base of tree trunk. No distinction is made unless specially requested between deciduous and coniferous trees. Tree symbol does not reflect extent of tree canopy. Do not plot single trees within a tree mass outline.

**Tree Canopy (Special Request Only)**

Digitize center of trunk and place canopy to show extent of branches.

**Tree Mass**

Group of trees too close together to allow individual plotting. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature (e.g., vehicular trail, creek over 10 ft wide) or any railroad line, regardless of canopy spread.

**B-12. Drainage Structures**

**Catch Basin**

Symbolize all visible catch basins as square catch basins. Digitize center.

**Concrete Headwall**

Concrete on the end of a transverse drain or pipe culvert. Digitize the center lines of headwalls less than 10 ft long. Digitize outer edge of thicker and larger headwalls. Headwalls have precedence over culvert symbology.

**Culvert (Over 5 ft Wide)**

Pipe drain located under roads. Digitize center of each end of pipe. Do not show culverts if headwalls are present.

**Paved Side Ditch**

Digitize outer edge of paved ditch. Do not show water line inside ditch. Retaining wall has precedence over paved ditch. Paved ditch has precedence over sidewalk or slab. Cap ends or join cleanly with headwalls, if present.

**B-13. Signs and Traffic Control**

**Billboard**

Digitize the center of each post of billboard. Label "BB."

**B-14. Utilities**

**Light Pole**

Digitize center of street lights along roads. Do not show lights in parking lots or yard lights. Show lone, large light poles also (such as stadium lights or large lights at ballfields).

**Power Pole**

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole.

**Substation**

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures. Substation outline has precedence over slab, unpaved drive, and trail. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

**Transmission Tower**

Large structure for supporting power lines across long distances. Digitize base of tower.



## **B-15. Contours**

### **Depressed Index Contour**

See B-7*b*. Follow the same guidelines as for index contours.

### **Depressed Intermediate Contour**

See B-7*b*. Follow the same guidelines as for intermediate contours.

### **Hidden Depressed Index Contour**

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

### **Hidden Depressed Intermediate Contour**

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

### **Hidden Index Contour**

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

### **Hidden Intermediate Contour**

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

### **Index Contour**

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

### **Index Contour Label**

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

### **Intermediate Contour**

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

### **Spot Elevation**

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- a.* All road and/or railroad intersections.
- b.* At each end of bridges on center line of road.
- c.* At center line of roads above culverts.
- d.* At the highest point of closed contour tops.
- e.* At the lowest point of closed depressions, significant saddles, and quarries.

*f.* At points visible through dense vegetation in obscured areas.

*g.* Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated parallel to the bottom of the sheets unless otherwise requested.

### **Water Elevation**

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

## **B-16. Manuscript Data**

### **Contour Limit Line**

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

### **Control Point**

Point used for both horizontal and vertical control. Place at coordinates and label.

### **Control Point Annotation**

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

### **Grid Annotation**

Place as appropriate. Use commas.

### **Grid Lines (Special Request Only)**

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

### **Grid Tick**

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

### **Horizontal Control Point**

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

### **Match Line**

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

### **Model Limit Line**

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

### **Standard Border**

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

### **Vertical Control Point**

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

#### *Section III*

#### *Feature Depiction Specifications*

*Nominal Scale: 200 Feet per Inch*

*Target Scale Range: 180 to 320 Feet per Inch*

## **B-17. Transportation**

### **Abandoned Railroad**

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.

### **Bridge**

Structure erected over obstacle or depression. Digitize general shape of bridge. "Bridge" includes automotive bridges, railroad bridges, and viaducts. Continue all depictions across bridge, including edge of paved road, if item continues on the bridge. Do not contour bridges.

### **Commercial Paved Parking Over 200 ft Long**

Digitize edge of parking lot; do not show parking lot islands. Retaining wall has precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

### **Commercial Unpaved Parking Over 200 ft Long**

Do not open paved surface for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

### **Guardrail Over 200 ft Long**

Digitize center line of any visible guardrails.

### **Paved Drive Over 200 ft Long**

Define by edge of pavement. Paved drive has precedence over unpaved road or drive. Paved road and retaining wall have precedence over paved drive.

### **Paved Road**

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

### **Railroad**

Digitize center line of all rails in use. Do not show sidings and spurs (tracks for storage, etc.).

### **Retaining Wall (Major)**

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

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**Runway**

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown as unpaved roads.

**Trail**

Visible, permanent dirt passageway greater than 200 ft long. Digitize center line of trail.

**Unpaved Drive Over 200 ft Long**

Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

**Unpaved Road**

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Unpaved road edge has precedence over unpaved drive or parking lot. Use unpaved road symbology for unpaved runways.

**B-18. Structures**

**Area Under Construction**

Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction and any feature that has been completed (e.g., completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

**Athletic Field**

Outline field only if not depicted by fence. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

**Building**

"Building" includes visible lone residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, etc. as part of the building. All buildings are to end at the mapping contract boundary. Smokestacks are shown as buildings, if freestanding.

**Broadcast Antenna**

Radio or television tower. Digitize center of tower.

**Cemetery**

Delineate cemetery boundary only if not bounded by a fence line. Show paved and unpaved drives and buildings. Do not show headstones or sidewalks. Label "Cemetery."

**Commercial Pier**

Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers. Label "PIER."

**Dam**

Barrier across river, creek, or swamp to regulate or obstruct water flow. Label "Dam."

**Debris (Greater than 20 ft H 20 ft)**

Scattered and unsorted material completely obscuring ground. Digitize outline of area and label "DEBRIS." Do not contour.

**Fence**

Digitize center lines of visible back property line and cross-country fences.

**Field Line (Special Request Only)**

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

**Golf Course**

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, or sand traps except upon special request. Show all paved drives (cart paths) that are permanent in nature. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

**Jetty**

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

**Levee**

Earth wall for fluid retention, usually found along rivers or canals. Digitize outer edge of levee on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

**Miscellaneous Feature**

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

**Ornamental Wall**

Fixed structure of concrete or brick not used for retention of earth. Digitize center line of walls over 20 ft long. Ornamental wall has precedence over fence or cemetery.

**Pipeline**

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter usually found near industrial areas or public utilities plants. Digitize center line, label "PIPE." Do not show supporting structures.

**Quarry**

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

**Residential Retaining Wall (Minor)**

Fixed structure retaining earth not located along a thoroughfare. Digitize center line of walls over 20 ft long, and pattern so ticks are on high side of wall. Minor retaining wall has precedence over fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

**Riprap (Over 20 ft x 20 ft)**

Rocks placed along slopes to lessen erosion. Outline large riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent nonpermanent irregular surface.

**Ruin or Under Construction Building**

Delineate visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

**Silo (Visible)**

Large cylindrical receptacle for farm product storage. Label "SILO."

**Storage**

Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area and label "STORAGE." Do not contour piled areas or areas stacked so that the ground is not visible. Retaining wall symbology takes precedence over storage outline. Outline junkyards with storage line and label "JUNKYARD."

**Tank (Visible)**

Public utility storage tank. Digitize edge of tank. Label "TANK."

**Trailer Park**

Digitize edge of trailer park as apparent from lot location, property lines, and other clues. Do not show trailers within trailer parks; do show buildings within parks, if present. Show drives over 200 ft long. Label "Trailer Park."

**Underground Pipeline**

Digitize center line of apparent underground utility pipelines. Label "U/G PIPE."

**Visible Public Pool**

Digitize interior edge of concrete around inground pools. Label "POOL." Also use pool for aeration pools in industrial areas.

**B-19. Natural Features**

**Creek**

Nonnavigable stream. Digitize shorelines of streams wider than 15 ft, and digitize center lines of streams narrower than 15 ft. Join creeks cleanly with rivers, lakes, or ponds. Do not pull tree mass lines across double-wide creeks.

**Lake**

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

**Pond**

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

**River**

Navigable stream. Digitize shorelines.

**Swamp**

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

**Tree Mass**

Group of trees too close together to allow individual plotting. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature (e.g., vehicular trail, creek over 15 ft wide) or any railroad line, regardless of canopy spread.

## **B-20. Drainage Structures**

### **Concrete Headwall**

Concrete on the end of a transverse drain or pipe culvert. Digitize the center of headwalls less than 20 ft long. Digitize outer edge of thicker and larger headwalls.

### **Paved Ditch**

Digitize center line of paved ditch. Do not show water line inside ditch. Retaining wall has precedence over paved ditch. Cap ends or join cleanly with headwalls, if present.

## **B-21. Utilities**

### **Power Pole**

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole.

### **Transmission Tower**

Large structure for supporting power lines across long distances. Digitize base of tower.

### **Substation Greater than 20 ft H 20 ft**

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures. Substation outline has precedence over slab, unpaved drive, and trail. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

## **B-22. Contours**

### **Depressed Index Contour**

See B-7*b*. Follow the same guidelines as for index contours.

### **Depressed Intermediate Contour**

See B-7*b*. Follow the same guidelines as for intermediate contours.

### **Hidden Depressed Index Contour**

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

### **Hidden Depressed Intermediate Contour**

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

### **Hidden Index Contour**

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

### **Hidden Intermediate Contour**

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

### **Index Contour**

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

### **Index Contour Label**

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

### **Intermediate Contour**

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

### **Spot Elevation**

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- a.* All road and/or railroad intersections.
- b.* At each end of bridges on center line of road.
- c.* At center line of roads above culverts.
- d.* At the highest point of closed contour tops.
- e.* At the lowest point of closed depressions, significant saddles, and quarries.
- f.* At points visible through dense vegetation in obscured areas.
- g.* At any location necessary to provide that no more than 2 in. exist between any contour and/or spot elevation.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated parallel to the bottom of the sheets unless otherwise requested.

### **Water Elevation**

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

## **B-23. Manuscript Data**

### **Contour Limit Line**

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

### **Control Point**

Point used for both horizontal and vertical control. Place at coordinates and label.

### **Control Point Annotation**

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

### **Grid Annotation**

Place as appropriate. Use commas.



**Grid Lines (Special Request Only)**

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

**Grid Tick**

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

**Horizontal Control Point**

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

**Match Line**

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

**Model Limit Line**

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

**Standard Border**

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

**Vertical Control Point**

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

*Section IV*

*Feature Depiction Specifications*

*Nominal Scale: 400 Feet per Inch*

*Target Scale Range: 340 to 500 Feet per Inch*

**B-24. Transportation**

**Abandoned Railroad (Visible)**

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.

**Bridge**

Structure erected over obstacle or depression. Digitize general shape of bridge. Do not contour.

**Commercial Paved Parking Over 400 ft Long**

Digitize edge of pavement of parking lot; do not show islands. Retaining wall has precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

**Commercial Unpaved Parking Over 400 ft Long**

Do not open paved surface for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

**Paved Drive Over 400 ft Long**

Define by edge of pavement. Paved drive has precedence over unpaved road or drive. Paved road and retaining wall have precedence over paved drive.

**Paved Road**

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

**Railroad**

Digitize center line of visible rails in use. Do not show sidings and spurs (tracks for storage, etc.).

**Retaining Wall (Major)**

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

**Runway**

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes visible helipads. Show unpaved runways with unpaved road symbology.

**Unpaved Drive Over 400 ft Long**

Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

**Unpaved Road (Visible)**

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Unpaved road edge has precedence over unpaved drive or parking lot. Use unpaved road symbology to depict unpaved runways.

**B-25. Structures**

**Area Under Construction**

Digitize outline of entire area under construction that is visible. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

**Athletic Field**

Outline field only if not depicted by fence. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

**Broadcast Antenna**

Radio or television tower. Digitize center of tower.

**Building**

Digitize general shape of buildings over 40 ft H 40 ft. Show no trailers. All buildings are to end at the mapping contract boundary. Visible smokestacks are shown as buildings if freestanding.

**Cemetery**

Delineate cemetery boundary only if not bounded by a fence line. Show paved drives over 400 ft long. Label "CEMETERY."

**Commercial Pier**

Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers. Label "PIER."

**Dam**

Barrier across river, creek, or swamp to regulate or obstruct water flow. Label "DAM."

**Debris (Visible)**

Scattered and unsorted material completely obscuring ground. Digitize outline of area and label "DEBRIS."  
Do not contour.

**Fence**

Digitize center lines of all visible cross-country fences.

**Field Line (Special Request Only)**

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

**Golf Course**

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, or sand traps except upon special request. Show all paved drives (cart paths) that are permanent in nature and over 400 ft long. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

**Jetty**

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

**Levee**

Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of top of levee visible on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

**Miscellaneous Feature**

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

**Ornamental Wall (Visible)**

Fixed structure of concrete or brick not used for retention of earth. Digitize center line of walls over 40 ft long. Ornamental wall has precedence over fence or cemetery.

**Quarry**

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

**Pipeline**

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize center line; label "PIPE." Do not show supporting structures.

**Residential Retaining Wall (Minor)**

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line of walls over 40 ft long and pattern so ticks are on high side of wall. Retaining wall has precedence over fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

**Riprap (Over 40 ft x 40 ft)**

Rocks placed along slopes to lessen erosion. Outline large riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent nonpermanent irregular surface.

**Ruin or Under Construction Building**

Delineate all visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

**Silo (Visible)**

Large cylindrical receptacle for farm product storage. Label "SILO."

**Storage**

Stacked material or piles of dirt, sand, gravel, salt, etc., completely obscuring ground. Digitize outline of area and label "STORAGE." Retaining wall symbology takes precedence over storage outline. Outline visible junkyards and label "JUNKYARD."

**Tank (Visible)**

Public utility storage tank. Digitize edge of tank. Label "TANK."

**Trailer Park**

Digitize edge of trailer park as apparent from lot location, property lines, etc. Do not show trailers within trailer parks. Show drives over 400 ft long. Label "TRAILER PARK."

**Underground Pipeline**

Digitize center line of apparent underground pipelines. Label "U/G PIPE."

**B-26. Natural Features**

**Creek (Visible)**

Nonnavigable stream. Digitize center lines of streams. Join creeks cleanly with rivers, lakes, or ponds.

**Lake**

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

**River**

Navigable stream. Digitize shorelines.

**Pond (Visible)**

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

**Swamp**

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

**Tree Mass**

Group of trees. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature or any railroad line, regardless of canopy spread.

## **B-27. Drainage Structures**

### **Concrete Headwall**

Concrete on the end of a transverse drain or pipe culvert. Digitize the center line of visible headwalls.

### **Paved Ditch Over 40 ft Long**

Digitize center line of visible paved ditch. Retaining wall has precedence over paved ditch. Join cleanly with headwalls, if present.

## **B-28. Utilities**

### **Substation Greater than 40 ft H 40 ft**

High-voltage units grouped together, usually within a fence. Digitize outline. Show large structures within substations as miscellaneous structures. Substation outline has precedence over unpaved drive. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

### **Transmission Tower**

Large structure for supporting power lines across long distances. Digitize base of tower.

## **B-29. Contours**

### **Depressed Index Contour**

See B-7*b*. Follow the same guidelines as for index contours.

### **Depressed Intermediate Contour**

See B-7*b*. Follow the same guidelines as for intermediate contours.

### **Hidden Depressed Intermediate Contour**

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

### **Hidden Index Contour**

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

### **Hidden Depressed Index Contour**

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

### **Hidden Intermediate Contour**

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

### **Index Contour**

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

### **Index Contour Label**

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

### **Intermediate Contour**

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

### **Spot Elevation**

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- a.* All road and/or railroad intersections.
- b.* At top of bridges on center line of road.
- c.* At center line of roads above culverts.
- d.* At the highest point of closed contour tops.
- e.* At the lowest point of closed depressions, significant saddles, and quarries.
- f.* At points visible through dense vegetation in obscured areas.
- g.* At any location necessary to provide that no more than 2 in. exist between any contour and/or spot elevation.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated parallel to the bottom of the sheets unless otherwise requested.

### **Water Elevation**

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

## **B-30. Manuscript Data**

### **Contour Limit Line**

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

### **Control Point**

Point used for both horizontal and vertical control. Place at coordinates and label.

### **Control Point Annotation**

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

### **Grid Annotation**

Place as appropriate. Use commas.

### **Grid Lines (Special Request Only)**

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

**Grid Tick**

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

**Horizontal Control Point**

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

**Match Line**

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

**Model Limit Line**

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

**Standard Border**

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

**Vertical Control Point**

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.