

Section 2. Construction Components

Sub- Section	Description
2.1	Source agency code (C4) MANDATORY
2.2	Site identification number (C1)MANDATORY
2.3	Record type (see below) MANDATORY
2.4	Record sequence number MANDATORY
2.5	Record sequence number of child MANDATORY
2.6	Person creating record
2.7	Date and time created
2.8	Person updating record
2.9	Date and time of last update
2.10	Record ready for Web
2.11	Remainder of record (depend on record type)

The CONSTRUCTION record data are grouped into and identified by eight component record types related to the construction of the well. The following is a list of the record types, brief description of the contents of the data record types and the construction data table names.

Record Type	Description of Contents	Data Table Name
CONS	Includes basic construction data	(gw_cons_##)
HOLE	Includes hole data	(gw_hole_##)
CSNG	Includes casing data	(gw_csng_##)
OPEN	Includes openings data	(gw_open_##)
LIFT	Includes lift, major pump, and standby pump	(gw_lift_##)
REPR	Includes minor repairs data	(gw_repr_##)
SPNG	Includes spring data	(gw_spng_##)
MPNT	Includes measuring-point data	(gw_mpnt_##)

All Construction records contain Source Agency, Site Identification (Site ID) number, Record Type, and Record Sequence Number to uniquely identify the record in the database.

The CONS Record is associated with ‘Child’ records and its Record Sequence Number becomes the Parent Sequence Number. HOLE, CSNG, and OPEN are the child records of CONS and have an additional Child Sequence Number assigned which uniquely identifies these records; child records MUST have a parent (in this instance CONS) record.

2.1 Source Agency

(CDAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that reported the data. The reporting agency is mandatory and a part of the primary key. Data for the site will not be stored if this field is blank.

2.2 Site Identification Number

(CDID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 15-digit site identification (Site ID) number of the site to which the construction data applies. If the site has not been entered into the Sitefile, this operation must be completed before the construction data are input. The Site ID number is mandatory and a part of the primary key.

2.3 Record Type

(CDRTYP - MANDATORY SECONDARY-KEY CHARX(4)):

The RECORD TYPE identifies the category of data included in the record. There are eight categories with the CONSTRUCTION data. This field is mandatory and is a secondary key. Data for the site will not be stored if this field is blank. The categories are as follows:

Record Type	Description
CONS	Construction record (C754)
HOLE	Hole record (C756)
CSNG	Casing record (C758)
OPEN	Openings record (C760)
LIFT	Lift record (C752)
REPR	Repairs record (C762)
SPNG	Spring record (C764)
MPNT	Measuring-point record (C766)

2.4 Record Sequence Number or Sequence Number of Parent

(CDRNUM - MANDATORY PRIMARY-KEY CHAR X(3)):

The record sequence number or sequence number of parent (HOLE, CSNG, OPEN sub-records) is assigned at the time of data entry to keep data by record type in a logical order. This number is mandatory and a part of the primary key. The component number for the record sequence number depends on the record type as follows:

Record	Description	Attribute Name
CONS	Construction record (C723)	cons_seq_nu
HOLE	Parent construction record (C59)	cons_seq_nu
CSNG	Parent construction record (C901)	cons_seq_nu
OPEN	Parent construction record (C902)	cons_seq_nu
LIFT	Lift record (C254)	lift_seq_nu
REPR	Repairs record (C165)	repr_seq_nu
SPNG	Spring record (C727)	spng_seq_nu
MPNT	Measuring-point record (C728)	mpnt_seq_nu

A parent CONS record must be established before HOLE, CSNG, or OPEN sub-record can be entered. HOLE, CSNG, or OPEN sub-records are identified using Parent

Sequence number, which relates the sub-record to the appropriate CONS record, and Record Sequence Number for the sub or ‘child’ record. For example, enter the sequence number (C723) of the construction (CONS) record to which the CSNG record is to be related. The CONS sequence number (C723) is the parent sequence number of HOLE, CSNG, and OPEN records, and relates the CSNG data to the proper construction record. This entry is mandatory; no information about the casing will be stored without a valid value for this field.

2.5 Record Sequence Number of Child Record (for HOLE, CSNG, & OPEN only)

(CDCRNM - MANDATORY CHAR X(3)):

Enter the sequence number of the child record. This number is assigned at the time of data entry to keep data by record type in a logical order; it is mandatory and a part of the primary key. Data for the site will not be stored if this field is blank.

Record	Description	Attribute Name
HOLE	Hole record (C724)	hole_seq_nu
CSNG	Casing record (C725)	csng_seq_nu
OPEN	Openings record (C726)	open_seq_nu

2.6 Person Creating Record

(CDCUID - CHAR X(8)):

This field contains the user identification of the person creating the record. User identification of the person creating the construction is entered automatically by the NWIS Software.

Record	Description	Attribute Name
CONS	Construction record (C403)	cons_cn
HOLE	Hole record (C406)	hole_cn
CSNG	Casing record (C409)	csng_cn
OPEN	Openings record (C412)	open_cn
LIFT	Lift record (C415)	lift_cn
REPR	Repairs record (C418)	repr_cn
SPNG	Spring record (C421)	spng_cn
MPNT	Measuring-point record (C424)	mpnt_cn

2.7 Date and Time Created

(CDCRDT/C404 - CHAR X(14)):

This field contains the date and time that the construction record was created. The date and time are entered automatically by the NWIS software.

Field	Component	Attribute Name
CONS	Construction record (C404)	cons_cr
HOLE	Hole record (C407)	hole_cr
CSNG	Casing record (C410)	csng_cr
OPEN	Openings record (C413)	open_cr
LIFT	Lift record (C416)	lift_cr
REPR	Repairs record (C419)	repr_cr
SPNG	Spring record (C422)	spng_cr
MPNT	Measuring-point record (C425)	mpnt_cr

2.8 Person Updating Record (CDUUIID/C405 - CHAR X(8)):

This contains the user identification (User ID) of the person updating the construction record. The user ID is entered automatically by the NWIS software.

Record	Description	Attribute Name
CONS	Construction record (C405)	cons_mn
HOLE	Hole record (C408)	hole_mn
CSNG	Casing record (C411)	csng_mn
OPEN	Openings record (C414)	open_mn
LIFT	Lift record (C417)	lift_mn
REPR	Repairs record (C420)	repr_mn
SPNG	Spring record (C423)	spng_mn
MPNT	Measuring-point record (C426)	mpnt_mn

2.9 Date and Time of Last Update (CDUPDT/C755 - CHAR X(14)):

This contains the date and time that the construction record was last updated. The date and time are entered automatically by the NWIS software.

Record	Description	Attribute Name
CONS	Construction record (C755)	cons_md
HOLE	Hole record (C757)	hole_md
CSNG	Casing record (C759)	csng_md
OPEN	Openings record (C761)	open_md
LIFT	Lift record (C753)	lift_md
REPR	Repairs record (C763)	repr_md
SPNG	Spring record (C765)	spng_md
MPNT	Measuring-point record (C767)	mpnt_md

2.10 Record Ready for Web (CDWBFG/C850 - SK7 - CHAR X):

This field contains the status and availability of a record for display on the World-Wide-Web.

The codes and their descriptions are:

Code	Description
Y	Yes-Record has been checked and is ready for Web display.
C	Conditional-Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

Record	Description	Attribute Name
CONS	Construction record (C850)	cons_web_cd
HOLE	Hole record (C851)	hole_web_cd
CSNG	Casing record (C852)	csng_web_cd
OPEN	Openings record (C853)	open_web_cd
LIFT	Lift record (C854)	lift_web_cd
REPR	Repairs record (C855)	repr_web_cd
SPNG	Spring record (C856)	spng_web_cd
MPNT	Measuring-point record (C857)	mpnt_web_cd

2.11 Data Dependent on Record Type

2.11.1 Construction Record -- CDRTYP = CONS

Data elements common to all Construction Data Records for CONS Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (CONS)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of construction data is identified by coding "CONS" for the type of construction record. The CONS components are entered as follows:

Sub-Section	Attribute Name	Description
2.11.1.1	cons_dt	Date of construction (C60)
2.11.1.2	cons_contractor_nm	Name of contractor (C63)
2.11.1.3	cons_src_cd	Source of construction data (C64)
2.11.1.4	cons_meth_cd	Method of construction (C65)
2.11.1.5	finish_cd	Type of finish (SK5) (C66)
2.11.1.6	seal_cd	Type of seal (C67)
2.11.1.7	seal_depth_va	Depth to bottom of seal (C68)
2.11.1.8	dev_meth_cd	Method of development (C69)
2.11.1.9	dev_du	Hours of development (C70)
2.11.1.10	special_treat_cd	Special treatment (C71) during development

**2.11.1.1 Date of Completed Construction
(CDCODT/C60 - SK4 - CHAR X(8) -- cons_dt):**

Enter the date on which the work was completed. If the day or month is not known, enter blanks in the spaces. Use leading zeros for values of day and month less than ten, and specify all four digits for the year. For many sites, this date will be the same as the one entered earlier as date of first construction (C21); however, it must be entered here. All GWSI related dates are validated using this date; entry for any other date must be later than or equal to this date.

**2.11.1.2 Name of Contractor/Driller
(CDCOCT/C63 - CHAR X(12) -- cons_contractor_nm):**

Enter the name of the individual or company that did the work. If needed to fit the space, use meaningful abbreviations or acronyms for company names.

**2.11.1.3 Source of Construction Data
(CDCOSC/C64 - CHAR X(1) -- cons_src_cd):**

Enter the code that best indicates the source of construction data or who furnished the data. The codes are the same as those used for Source of Depth Data. The codes and their descriptions are:

Code	Description
A	Reported by another government agency. Do not use A if the reporting agency is the owner of the well--use O .
D	From driller's log or report.
G	Private geologist-consultant or university associate.
L	Depth interpreted from geophysical logs by personnel of source agency.
M	Memory (owner, operator, driller): less reliable than O – reported by owner.
O	Reported by the owner of the well.
R	Reported by person other than the owner, driller, or another government agency.
S	Measured by personnel of reporting agency.
Z	Other source (explain in remarks).

2.11.1.4 Method of Construction

(CDCOME/C65 - CHAR X(1) -- cons_meth_cd):

Enter the code that best indicates the method by which the site was constructed.

Allowable codes are:

Code	Description	Code	Description
A	Air-rotary	P	Air percussion
B	Bored or augered	R	Reverse rotary
C	Cable-tool	T	Trenching
D	Dug	V	Driven
H	Hydraulic rotary	W	Drive and wash
J	Jetted	Z	Other (explain in remarks)

- (A) Air-rotary method is one in which a stream of air is used to cool the bit and bring the rock cuttings to the surface.
- (B) A bored or augered hole is one in which the earth materials are cut and removed from the hole with an auger. The auger may be powered by hand or machinery.
- (C) Cable-tool refers to a well drilled by the familiar "percussion" or "churn-drill" method, whereby a heavy drilling tool is raised and lowered with enough force to pulverize the rock. The rock debris is commonly removed from the hole with a bailer. The California mud-scow method is a special variation of the cable-tool method.
- (D) Dug holes are excavated by hand tools or power-driven digging equipment. Caissons, Ranney-type collectors, and galleries belong in this classification, even though they may have laterals that are driven or jetted. Tunnels would also be in this category.
- (H) The hydraulic-rotary well is constructed by rotating a length of pipe (drill stem) equipped with a bit that cuts or grinds the rocks. Water or drilling mud is pumped down the drilling stem. Cuttings are carried to the surface in the annular space

between the drilling stem and the wall of the hole. Note that separate categories are provided for air-rotary and reverse-rotary.

- (J) Jetted wells are excavated by using high-velocity streams of water pumped through a pipe having a restricted opening or "jetting" nozzle. For some types of earth materials a cutting bit is attached to the end of the jetting pipe. The material cut or washed from the hole is carried to the surface in the annular space outside the pipe as by the hydraulic-rotary method. This method is most suitable for construction of small-diameter wells in unconsolidated material.
- (P) An air-percussion drill is a cutting tool powered by compressed air. It uses a rapid percussion effect, coupled with rotary action, to drill hard rocks. Compressed air also is used to blow the cuttings from the hole. Air-percussion drills are generally used in conjunction with air-rotary drilling rigs.
- (R) Reverse rotary is similar to the hydraulic rotary except that the water or drilling mud flows down the annular space between the drilling stem and the wall of the hole and the cuttings are pumped out through the drill stem.
- (T) Trenching refers to the construction of a sump or open pit from which ground water may be pumped. Trenching may be done by hand, but more commonly power equipment such as a bulldozer, dragline power shovel, or a backhoe is used. Ponds and drains belong in this category of construction.
- (V) Driven wells are constructed by driving a length of pipe, usually of small diameter and generally equipped with a sand point, to the desired depth. The wells may be driven by hand or with air hammer or other power equipment. An essential feature of a driven well is that no earth material is removed as the well is constructed.
- (W) Drive and wash wells are constructed by driving a small diameter open-end casing a few feet into the earth, then washing out the material from inside the casing with a jet of water. The process is repeated until the well has penetrated a sufficient depth into the aquifer.

2.11.1.5 Type of Finish

(CDCOFI/C66 - SK5 - CHAR X(1) -- finish_cd):

Enter the code indicating the method of finish or the nature of the openings that allow water to enter the well. Allowable codes are:

Code	Finish/Openings	Code	Finish/Openings
C	Porous concrete	S	Screen
F	Gravel pack w/perforations	T	Sand point
G	Gravel pack w/screen	W	Walled
H	Horizontal gallery	X	Open hole
O	Open end	Z	Other (explain in remarks)
P	Perforated or slotted		

- (C) Porous concrete is concrete casing that is pervious enough to allow ground-water to seep into the well.

- (F & G) A gravel-pack well is a drilled or dug well that has a gravel envelope opposite the part through which water enters. Commonly, these wells will be finished either with commercial screen or with slotted casing.
- (H) A horizontal gallery or collector essentially is a horizontal type well in which the screen, slotted pipe, or gravel-filled trench is horizontal. All horizontal wells should be in this class, including Ranney collectors and infiltration galleries.
- (O) An open-end well is one that is cased to the bottom of the hole so that water can enter the well only through the bottom of the hole.
- (P) Perforated or slotted casing is well pipe that has had holes punched or slots cut in it to admit water. Do not use this designation if the well has a gravel pack. Use 'F' instead.
- (S) Screen refers to commercial well screen manufactured for the purpose of admitting water to a well. Common types of screen are wire mesh, wrapped trapezoidal wire, and shutter screen. Do not use this designation if the well also has a gravel pack. Use 'G' instead.
- (T) A sand point is the screen part of a drive point and usually is part of a driven well.
- (W) A walled or shored well is usually a dug well in which the walls have been shored up with open-jointed fieldstone, brick, tile, concrete blocks, wood cribbing, or other material. A few wells of this type may have gravel walls; however, they should be placed in this category instead of F or G. A dug well that is mostly open hole but has even a few feet of cribbing, corrugated pipe, or other shoring to prevent caving, should be in this category.
- (X) An open-hole well is one that has a finished open hole in the aquifer. A well belongs in this class even if the casing does not actually extend to the geologic unit or zone from which the water is obtained.

2.11.1.6 Type of Seal

(CDCOSL/C67 - CHAR X(1) -- seal_cd):

Enter the code indicating the type of material used to seal the well against the entry of surface water. Allowable codes are:

Code	Material Used
B	Bentonite
C	Clay or cuttings
G	Cement grout
N	None
Z	Other (explain in remarks)

2.11.1.7 Depth to Bottom of Seal

(CDCOSD/C68 - CHAR X(4) -- seal_depth_va):

Enter the depth to the bottom of the seal, in feet below land surface, to the nearest foot.

**2.11.1.8 Method of Development
(CDCODM/C69 - CHAR X(1) -- dev_meth_cd):**

Enter the code indicating the method used to develop the well. The codes and their descriptions are:

Code	Method	Code	Method
A	Pumped with air lift	N	None
B	Bailed	P	Pumped
C	"Blown" or surged w/compressed air	S	Surged with surge block
J	Washed or jetted	Z	Other (explain in remarks)

**2.11.1.9 Hours of Development
(CDCODV/C70 - CHAR X(3) -- dev_du):**

Enter the number of hours that the well was bailed, pumped, and so forth, for development.

**2.11.1.10 Special Treatment During Development
(CDCOST/C71 - CHAR X(1) -- special_treat_cd):**

Enter the code indicating any special treatment that was applied during development of the well. The codes and their descriptions are:

Code	Description	Code	Description
C	Chemical (acid, and so forth)	H	Hydrofracturing
D	Dry ice	M	Mechanical abrasion
E	Explosives	Z	Other (explain in remarks)
F	Deflocculent		

2.11.2 Hole Record -- CDRTYP = HOLE

Data elements common to all Construction Data Records for HOLE Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (HOLE)
- Record sequence number or sequence number of parent
- Record sequence number of child
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of hole data is identified by coding "**HOLE**" for the type of construction record. The HOLE components are entered as follows:

Sub-Section	Attribute Name	Description
2.11.2.1	hole_top_va	Depth to top of this interval (C73) MANDATORY
2.11.2.2	hole_bottom_va	Depth to bottom of this interval (C74)
2.11.2.3	hole_dia_va	Diameter of this interval (C75)

**2.11.2.1 Depth to Top of Interval
(CDHTOP/C73 - MANDATORY CHAR X(8) -- hole_top_va):**

Enter the depth to the point where this section of hole begins, in feet below land surface. The first section of hole always begins at depth 0. This value is mandatory so data for the site will not be stored if this field is blank.

**2.11.2.2 Depth to Bottom of Interval
(CDHBOT/C74 - CHAR X(8) -- hole_bottom_va):**

Enter the depth to the bottom of the hole segment, in feet below land surface.

**2.11.2.3 Diameter of Interval
(CDHDIA/C75 - CHAR X(5) -- hole_dia_va):**

Enter the nominal diameter of the bit used to drill this section of the hole or the diameter to which the hole was reamed, in inches.

2.11.3 Casing Record -- CDRTYP = CSNG

Data elements common to all Construction Data Records for CSNG Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (CSNG)
- Record sequence number or sequence number of parent
- Record sequence number of child
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of casing data is identified by coding "CSNG" for the type of construction record. The CSNG components are entered as follows:

Sub- Section	Component Name	Description
2.11.3.1	csng_top_va	Depth to top of this casing interval (C77)MANDATORY
2.11.3.2	csng_bottom_va	Depth to bottom of this casing interval (C78)
2.11.3.3	csng_dia_va	Diameter of this casing interval (SK6) (C79)
2.11.3.4	csng_material_cd	Casing material (C80)
2.11.3.5	csng_thick_va	Casing thickness (C81)

2.11.3.1 Depth to Top of Casing

(CDCSTP/C77 - MANDATORY CHAR X(8) -- csng_top_va):

Enter the depth to the top of this section of casing, in feet below land surface. If the casing extends above land surface, enter the height of the casing above land surface preceded by a minus sign (-). This field is mandatory; the casing information will be rejected if a value is not specified.

2.11.3.2 Depth to Bottom of Casing

(CDCSBT/C78 - CHAR X(8) -- csng_bottom_va):

Enter the depth to the bottom of this section of casing, in feet below land surface.

2.11.3.3 Diameter of Casing

(CDCSDI/C79 - SK6 - CHAR X(5) -- csng_dia_va):

Enter the nominal diameter of this section of casing, in inches. Two decimal places are provided for fraction sizes (1 1/4 = 1.25).

2.11.3.4 Casing Material

(CDCSMT/C80 - CHAR X(1) -- csng_material_cd):

Enter the code indicating the material from which the casing is made. The codes and their descriptions are:

Code	Description	Code	Description
A	ABS	P	PVC or Plastic
B	Brick	Q	FEP
C	Concrete	R	Rock or Stone
D	Copper	S	Steel
E	PTFE	T	Tile
F	Fiberglass	U	Coated Steel
G	Galvanized Iron	V	Stainless Steel
H	Fiberglass Plastic	W	Wood
I	Wrought Iron	X	Steel Carbon
J	Fiberglass Epoxy	Y	Steel-Galvanized
K	PVC Threaded	Z	Other Material
L	Glass	4	Stainless 304
M	Other Metal	6	Stainless 316
N	PVC Glued		

**2.11.3.5 Casing Thickness
(CDCSTK/C81 - CHAR X(6) -- csng_thick_va):**

Enter the thickness of the casing wall, in inches. Three decimal places are provided.

2.11.4 Openings Record -- CDRTYP = OPEN

Data elements common to all Construction Data Records for OPEN Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (OPEN)
- Record sequence number or sequence number of parent
- Record sequence number of child
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of openings data is identified by coding “**OPEN**” for the type of construction record. The OPEN components are entered as follows:

Sub-Section	Component Name	Description
2.11.4.1	open_top_va	Depth to top of this open interval (C83) MANDATORY
2.11.4.2	open_bottom_va	Depth to bottom of this open interval (C84)
2.11.4.3	open_dia_va	Diameter of this open interval (C87)
2.11.4.4	open_material_cd	Material in this interval (C86)
2.11.4.5	open_cd	Type of openings in this interval (C85) MANDATORY
2.11.4.6	open_len_va	Length of openings (C89)
2.11.4.7	open_width_va	Width of openings (C88)

**2.11.4.1 Depth to Top of Opening Interval
(CDOTOP/C83 - MANDATORY CHAR X(8) -- open_top_va):**

Enter the depth to the top of the open section, in feet below land surface. This field is mandatory; information about the open interval will not be stored if this field does not contain a valid entry.

**2.11.4.2 Depth to Bottom of Opening Interval
(CDOBOT/C84 - CHAR X(8) -- open_bottom_va):**

Enter the depth to the bottom of the open section, in feet below land surface.

2.11.4.3 Diameter of Opening Interval
(CDODIA/C87 - CHAR X(5) -- open_dia_va):

Enter the inside diameter, in inches, of perforated or slotted pipe, the diameter of a screen, or the diameter of the hole, if the well is finished open-hole.

2.11.4.4 Material Type
(CDOMAT/C86 - CHAR X(1) -- open_material_cd):

Enter the code indicating the type of material from which the screen or other open section is made. The codes and their descriptions are:

Code	Description	Code	Description
A	ABS	N	PVC Glued
B	Brass/Bronze	P	PVC
C	Concrete	Q	FEP
D	Ceramic	R	Stainless Steel
E	PTFE	S	Steel
F	Fiberglass	T	Tile
G	Galvanized iron	V	Brick
H	Fiberglass Plastic	W	Membrane
I	Wrought iron	X	Steel Carbon
J	Fiberglass Epoxy	Y	Steel-Galvanized
K	PVC Threaded	Z	Other
L	Glass	4	Stainless 304
M	Other Metal	6	Stainless 316

2.11.4.5 Type of Opening
(CDOTYP/C85 - MANDATORY CHAR X(1) -- open_cd):

Enter the code indicating type of open section. The codes and their descriptions are:

Code	Description	Code	Description
F	Fractured rock	S	Screen, type not known
L	Louvered or shutter-type	T	Sand point screen
M	Mesh screen	W	Walled or shored
P	Perforated, porous, or slotted casing	X	Open hole
R	Wire-wound screen	Z	Other (explain in remarks)

This field is mandatory; information about the openings will not be stored if this field is blank.

**2.11.4.6 Length of Opening
(CDOLEN/C89 - CHAR X(6) -- open_len_va):**

Enter the long dimension of perforations or slots, in inches. This refers to the individual openings in the screen or slotted pipe.

**2.11.4.7 Width of Opening
(CDOWID/C88 - CHAR X(6) -- open_width_va):**

Enter the short dimension of perforations or slots, or the mesh size of screens, in inches.

2.11.5 Lift Record -- CDRTYP = LIFT

Data elements common to all Construction Data Records for LIFT Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (LIFT)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of lift data is identified by coding “LIFT” for type of construction record. Enter the LIFT components as follows:

Sub-Section	Attribute Name	Description
2.11.5.1	lift_cd	Type of lift (C43) MANDATORY
2.11.5.2	lift_dt	Date this lift was installed or recorded (C38)
2.11.5.3	intake_depth_va	Depth to intake (C44)
2.11.5.4	power_cd	Type of power (C45)
2.11.5.5	hp_va	Horsepower rating (C49)
2.11.5.6	manufacturer_nm	Manufacturer of lift device (C48)
2.11.5.7	serial_no_va	Serial number of lift device (C46)
2.11.5.8	power_co_nm	Name of power company (C50)
2.11.5.9	power_co_acct_va	Power-company account number (C51)
2.11.5.10	power_meter_va	Power-meter number (C52)
2.11.5.11	pump_rating_fc	Pump rating (C53)
2.11.5.12	add_lift_va	Additional lift (above land surface (C255)
2.11.5.13	maintainer_nm	Name of company that maintains the lift (C54)
2.11.5.14	capacity_va	Rated pump capacity (C268)
2.11.5.15	standby_cd	Type of standby power (C56)
2.11.5.16	standby_hp_va	Horsepower of standby power source (C57)

2.11.5.1 Type of Lift

(CDLTYP/C43 - MANDATORY SECONDARY-KEY CHAR X(1) -- lift_cd):

Enter the code indicating the type of pump or lift. This entry is mandatory; lift data will not be stored if this field is blank. Allowable codes are:

Code	Description	Code	Description
A	Air lift	R	Rotary pump
B	Bucket	S	Submergible pump
C	Centrifugal pump	T	Turbine pump
J	Jet pump	U	Unknown
P	Piston pump	Z	Other (explain in remarks)

- (A) Air lift is a type of lift in which a jet of air pumped below the water table causes a stream of mixed air and water to issue from the well.
- (B) Bucket includes the familiar "rope and bucket," chain and bucket lifts, and the small bailer lifted by a rope or chain and pulley.
- (C) Centrifugal pumps have rotating impellers in a closed chamber that draw the water into the pump. The water is then discharged from the pump, commonly under great pressure, by centrifugal force. Such pumps have maximum lift of about 25 feet but can force water to considerable heights above the pump.
- (J) Jet pumps have two pipes extending from the pump into the well. One pipe forces water down the hole under pressure while the other pipe discharges water that has been forced to the surface by the action of the jet. Jet pumps are used principally for small water supplies, such as would be used for a suburban home, farm, or small commercial establishment.
- (P) Piston pumps include the familiar lift and pitcher pumps common in many rural areas. The old "reciprocating" pumps and the "deep-well with walking-beam jacks" are of the piston type.
- (R) Rotary pumps operate on the principle that direct pressure is created by squeezing the water between specially designed runners. A relatively high vacuum may be created on the intake side so the suction lift is comparable to that for centrifugal pumps.
- (S) A submergible pump is a special type of turbine in which an electric motor is connected directly to the impellers and submerged beneath the water. It can be recognized by the presence of insulated electric wire leading into the well and the absence of any pump or power unit at the surface.
- (T) Turbines are of several types and may be for a deep or shallow well. A series of impellers, placed below the surface of the water, are rotated by a vertical shaft connected to a power source at the land surface. These impellers "pick up" the water and force it to the surface through the pump column. Such pumps are commonly used to lift large amounts of water at high pressure. They are used in high-capacity wells for public, industrial, or irrigation supply.
- (U) Use unknown only if the site is equipped with a pump about which other data are available, but the type of pump cannot be identified.

- (Z) Other. Place in this category any lifting device that does not belong in one of the other categories. Examples are: helical rotor, hydraulic ram, and siphon.

**2.11.5.2 Date Lift Installed or Recorded
(CDLDAT/C38 - CHAR X(8) -- lift_dt):**

Enter the date on which the lift data were collected. If the day and/or month are not known, enter blanks in the spaces. Use leading zeros for month or day less than ten, and specify all four digits for the year.

**2.11.5.3 Depth to Intake
(CDLINT/C44 - CHAR X(5) -- intake_depth_va):**

Enter the depth to the bottom of the pump bowls or intake, in feet below land surface. The value desired for this entry is the maximum distance the water level can be drawn down before the pump breaks suction.

**2.11.5.4 Type of Power
(CDLPWR/C45 - CHAR X(1) -- power_cd):**

Enter the code indicating the type of power used to power the pump. The codes and their descriptions are:

Code	Description	Code	Description
D	Diesel engine	L	LP gas (propane or butane engine)
E	Electric motor	N	Natural-gas engine
G	Gasoline engine	W	Windmill
H	Hand	Z	Other (explain in remarks)

**2.11.5.5 Horsepower Rating
(CDLHPR/C46 - SECONDARY-KEY CHAR X(7) -- hp_va):**

Enter the horsepower rating of the primary power source. Two decimal places are provided for small motors.

**2.11.5.6 Manufacturer of Lift Device
(CDLMFR/C48 - CHAR X(12) -- manufacturer_nm):**

Enter the name of the company that manufactured the pump. Use meaningful abbreviations or acronyms if needed to fit the space.

**2.11.5.7 Serial Number of Lift Device
(CDLSER/C49 - CHAR X(12) -- serial_no_va):**

Enter the serial number of the pump.

2.11.5.8 Name of Power Company
(CDLPCO/C50 - CHAR X(12) -- power_co_nm):

Enter the name of the company that furnished electricity, natural gas, or other fuel for the pump. Use meaningful abbreviations if needed to fit the space.

2.11.5.9 Power Company Account No.
(CDLACT/C51 - CHAR X(10) -- power_co_acct_va):

Enter the account number under which the power company stores information on power consumption at the site.

2.11.5.10 Power Meter No.
(CDLMTR/C52 - CHAR X(12) -- power_meter_va):

Enter the meter number of the electric or gas meter which records the power consumption of the pump.

2.11.5.11 Pump Rating
(CDLCNS/C53 - CHAR X(8) -- pump_rating_fc):

Enter the rating of the pump as the volume of water lifted per unit of power consumed. The value should be expressed as millions of gallons of water per kilowatt-hour of electricity, cubic foot of natural gas, gallon of liquid fuel or engine hour, depending upon the type of power coded under "lift data" above. (If the volume of water pumped is measured in other units, i.e., feet or metric units, convert to millions of gallons.)

2.11.5.12 Additional Lift
(CDLADL/C255 - CHAR X(3) -- add_lift_va):

Enter the additional head (above land-surface datum) against which the pump works, in feet of water. For a sprinkler system for irrigation, this is the height of the sprinklers above land-surface datum plus the pressure at the sprinklers (in feet of water).

2.11.5.13 Person or Company Who Maintains the Pump
(CDLMNT/C54 - CHAR X(12) -- maintainer_nm):

Enter the name of the person or company who is responsible for maintenance of the pump, if known.

2.11.5.14 Rated Pump Capacity
(CDLCAP/C268 - CHAR X(5) -- capacity_va):

Enter the manufacturer's pump capacity rating in gallons per minute.

**2.11.5.15 Type of Standby Power
(CDLSBY/C56 - CHAR X(1) -- standby_cd):**

Enter the code indicating the type of standby power available. The codes are listed for type of power under "lift data." Use the same codes listed in section [Type of Power \(Section 2.11.5.4\)](#).

**2.11.5.16 Horsepower of Standby Power
(CDLSHP/C57 - CHAR X(7)-- standby_hp_va):**

Record the horsepower rating of the standby power source.

2.11.6 Repairs Record -- CDRTYP = REPR

Data elements common to all Construction Data Records for REPR Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (REPR)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of minor site-repairs data is identified by coding “REPR” for type of construction record. The REPR components are entered as follows:

Sub-Section	Attribute Name	Description
2.11.6.1	repr_cd	Nature of repairs (C166) MANDATORY
2.11.6.2	repr_dt	Date of repairs (C167)
2.11.6.3	repr_contractor_nm	Name of contractor who made repairs (C169)
2.11.6.4	change_va	Percent change in performance after repairs (C170)

**2.11.6.1 Nature of Repair
(CDRNAT/C166 - MANDATORY CHAR X(1) -- repr_cd):**

Enter the code that best describes the nature of the repair work. The codes are:

Code	Description	Code	Description
B	Blocked off	O	Slotted or perforated
C	Cleaned	P	Plugged back
D	Deepened	S	Screen replaced
I	Pump intake lowered	Z	Other
L	Liner installed		

Nature of repair is a mandatory entry; repair data will not be stored without a value for this field.

2.11.6.2 Date of Repair

(CDRDAT/C167 - CHAR X(8) -- repr_dt):

Enter the date on which the repair work was completed. If the month and/or day are not known, enter blanks in the spaces. Use leading zeros for month and day less than ten, and use four digits for year.

2.11.6.3 Name of Contractor

(CDRCTR/C169 - CHAR X(12)-- repr_contractor_nm):

Enter the name of the individual or company that did the work. Use meaningful abbreviations or acronyms if needed to fit the space provided.

2.11.6.4 Percent Performance Change

(CDRCHG/C170 - CHAR X(3) -- change_va):

Enter the percentage by which the well performance was changed as a result of the work. Use whole numbers only. If the performance was decreased, enter the value with a preceding minus sign (-).

2.11.7 Spring Record -- CDRTYP = SPNG

Data elements common to all Construction Data Records for SPNG Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (SPNG)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of spring data is identified by coding “SPNG” for type of construction record. Enter the SPNG components as follows:

Sub- Section	Attribute Name	Description
2.11.7.1	spng_nm	Name of spring (C172)
2.11.7.2	spng_tp	Type of spring (C173)
2.11.7.3	permanence_cd	Permanence of spring (C174)
2.11.7.4	disc_sphere_cd	Sphere of discharge (C175)

Sub- Section	Attribute Name	Description
2.11.7.5	improvement_cd	Improvements (C176)
2.11.7.6	openings_nu	Number of spring openings (C177)
2.11.7.7	disc_variability_va	Flow variability (C178)
2.11.7.8	disc_variability_cd	Basis of flow variability (C179)

2.11.7.1 Name of Spring
(CDSNAM/C172 - CHAR X(40) -- spng_nm):

If the spring has a name by which it is known locally, enter the name here. Space is provided for up to 40 characters. If the name is longer, use meaningful abbreviations.

2.11.7.2 Type of Spring
(CDSTYP/C173 - CHAR X(1) -- spng_tp):

Enter the code indicating the type of spring. The codes and their descriptions are:

Code	Description	Code	Description
A	Artesian	K	Artesian and seepage or filtration
B	Perched and contact	L	Fracture and depression
C	Contact	P	Perched
D	Depression	O	Perched and fracture
E	Perched and depression	R	Perched and seepage or filtration
F	Fracture	S	Seepage or filtration
G	Geyser	T	Tubular - cave
H	Perched and tubular	Z	Other
J	Artesian and depression		

2.11.7.3 Permanence
(CDSPRM/C174 - CHAR X(1) -- permanence_cd):

Enter the code indicating the permanence of the spring. The codes and their descriptions are:

Code	Description	Code	Description
P	Perennial	G	Geyser
I	Intermittent	E	Periodic - ebb and flow
R	Response to precipitation	Z	Other
S	Seasonal		

- (P) Perennial refers to springs that discharge continuously.
- (I) Intermittent refers to springs that discharge only during certain periods but at other times are dry. Although all springs may be considered to be either perennial or intermittent, more descriptive detail can be included if it is available. The following characteristics describe special types of intermittent springs that may be coded:

- (R) Response to precipitation refers to springs that exist only after periods of rainfall.
- (S) Seasonal refers to springs that exist only during periods of high water levels.
- (G) Geyser refers to springs that discharge at more or less regular intervals. Discharge is caused by expansive force of highly heated steam.
- (E) Periodic - ebb and flow refers to springs that normally have periods of relatively greater discharge at regular and frequent intervals. Periodic springs may be perennial or intermittent. Periodic springs resemble geysers somewhat in their rhythmic action.

2.11.7.4 Sphere of Discharge

(CDSSPH/C175 - CHAR X(1) -- disc_sphere_cd):

Enter the code indicating the sphere into which the spring discharges. The codes and their descriptions are:

Code	Description
A	Subaerial
W	Subaqueous

2.11.7.5 Improvements

(CDSIMP/C176 - CHAR X(1) -- improvement_cd):

Enter the code indicating the type of improvements that have been constructed at or in association with the spring. The codes and their descriptions are:

Code	Description	Code	Description
B	Boxed or small covered basin	N	No improvements
C	Concrete basin	P	Pond
G	Gallery	R	Pipe (not for conduction)
H	Spring house	L	Lined
T	Trough	Z	Other (explain in remarks)

2.11.7.6 Number of Openings

(CDSNOP/C177 - CHAR X(3) -- openings_nu):

Enter the number of openings through which water discharges from the spring. If the openings are too numerous to count, enter a value of 999.

2.11.7.7 Flow Variability

(CDSVAR/C178 - CHAR X(3) -- disc_variability_va):

Where sufficient data are available to calculate or estimate the variability adequately, enter discharge variability of the spring, in percent, as expressed by the formula:

$$V = 100 \times [(a-b)/c]$$

V = Variability, in percent
a = Maximum discharge
b = Minimum discharge
c = Average discharge

2.11.7.8 Basis For Variability
(CDSACC/C179 - CHAR X(1) -- disc_variability_cd):

Enter the code indicating the basis on which the variability of the spring was determined. The codes and their descriptions are:

Code	Description
A	Calculated from less than 1 year of continuous discharge record
B	Calculated from 1 to 5 years of continuous discharge record
C	Calculated from more than 5 years of continuous discharge record
D	Calculated from intermittent measurements made over a period of more than 1 year
E	Calculated from less than 1 year of record, or estimated
Z	Determined by other method (explain in remarks)

2.11.8 Measuring-Point Record -- CDRTYP = MPNT

Data elements common to all Construction Data Records for MPNT Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (MPNT)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update)
- Record ready for Web

The entry of measuring-point data is identified by coding “MPNT” for type of construction record. Enter the MPNT components as follows:

Sub-Section	Attribute Name	Description
2.11.8.1	mpnt_begin_dt	Begin date for use of this measuring point (C321)
2.11.8.2	mpnt_end_dt	End date for use of this measuring point (C322)
2.11.8.3	mpnt_height_va	Height of this measuring point (C323)
2.11.8.4	mpnt_alt_va	Measuring point altitude (C325)
2.11.8.5	mpnt_alt_meth_cd	Method altitude determined (326)
2.11.8.6	mpnt_alt_acy_va	Measuring point altitude accuracy (C327)

Sub-Section	Attribute Name	Description
2.11.8.7	mpnt_alt_datum_cd	Measuring point altitude datum (C328)
2.11.8.8	mpnt_ds	Description of this measuring point (C324)

2.11.8.1 Beginning Date

(CDMPBD/C321 - CHAR X(8) -- mpnt_begin_dt):

Enter the date on which the measuring point was established. If the day and/or month are unknown, enter them as blanks. Use leading zeros for values of month and day that are less than ten, and specify all four digits for the year. **Note: Date is a control field; therefore, two entries with the same date will not be accepted.**

2.11.8.2 Ending Date

(CDMPED/C322 - CHAR X(8)-- mpnt_end_dt):

If this measuring point is no longer used, enter the date on which it was last used as a measuring point. A new occurrence of the measuring point data should be used for the new measuring point. In this way, a history of measuring point data corresponding to each water level can be maintained.

2.11.8.3 Height of Measuring Point

(CDMPHT/C323 - CHAR X(6) -- mpnt_height_va):

For observation wells or other wells where repeated measurements are made, enter the height of the measuring point, in feet, above or below land surface datum. Values for measuring points below land surface should be preceded by a minus sign (-).

2.11.8.4 Measuring Point Altitude

(CDMPAL/C325 - CHAR X(8) -- mpnt_alt_va):

Enter the altitude of the measuring point, in feet above mean sea level. An entry of Altitude also requires the entry of C326 (Method Altitude Determined), C327 (Measuring Point Altitude Accuracy), and C328 (Measuring Point Altitude Datum).

2.11.8.5 Method Altitude Determined

(CDMPME/C326 - CHAR X(1) -- mpnt_alt_meth_cd):

Enter the code of the method used to determine the altitude of the measuring point. When Measuring Point Altitude is entered, the code is **mandatory**. The codes are:

Code	Description
A	Altimeter
D	Differential Global Positioning System (GPS)
G	Global Positioning System
L	Level or other surveying method

Code	Description
M	Interpolated from topographic map
N	Interpolated from digital elevation model (DEM)
R	Reported
U	Unknown

2.11.8.6 Measuring Point Altitude Accuracy
(CDMPAC/C327 - CHAR X(3) -- mpnt_alt_acy_va):

Enter the altitude accuracy of the measuring point in terms of the possible error in feet. An accuracy of +/- 0.1 foot would be entered as ".1". Many altitudes are interpolated from the contours on topographic maps; accuracies determined in this way are generally entered as one-half of the contour interval.

2.11.8.7 Measuring Point Altitude Datum
(CDMPDC/C328 - CHAR X(10) -- mpnt_alt_datum_cd)

Enter the altitude datum of the measuring point:

Datum	Description
NGVD29	National Geodetic Vertical Datum of 1929
NAVD88	North American Vertical Datum of 1988
OLDAK	Old Alaska (Mainland) and Aleutian Island Datum
OLDPR	Old Puerto Rico and Virgin Island Datum
HILOCAL	Local Hawaiian Datum
ASLOCAL	Local American Samoa Datum
GULOCAL	Local Guam Datum
COE1912	COE Datum 1912

If new datums need to be added to this reference list, please refer to Database Administrators Manual, section 6.3.1. **Note: No conversions to alternate datums will be provided for the new datums.**

2.11.8.8 Measuring Point Description
(CDMPRM/C324 - CHAR X(94) mpnt_ds):

A detailed description of the measuring point may be entered here. Up to 94 characters of remarks are allowed.