

CHAPTER 13  
Pipe, RCB, Misc Structures,  
Retaining, Sound, and MSE Walls

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**DOCUMENTATION REQUIREMENT  
SECTION A  
PIPE, RCB, MISC STRUCTURES,  
RETAINING, SOUND, AND MSE WALLS  
(STRUCTURE LIST)**

Pipe, RCBs (drainage), and miscellaneous structures shall be documented in a PIPE, RCB, (DRAINAGE) or MISC STR book. Retaining, sound and MSE walls shall be documented in a RETAINING, SOUND, or MSE WALL book similar to pipe. Each area placed in a book shall have two sections - Stakeout Data and Construction Record.

To setup the field books the information on the above items shall be found in the contract plans on the Main Structure list, or on an individual structure list, or on the Estimate of Quantities. An illustration of a Drainage Structure List is shown below.

Documentation is different for each UOM type. All items shown on the structure list of the plans as incidental to the structure shall be documented in the book, except 201 and 202 removal items, as illustrated in Chapter 4, (Removal Items).

Documentation for only a few selected items is illustrated in this chapter. Documentation for practically any item can be provided by setting up the books in the same manner according to the UOM. Some minor modifications may be required to show the unusual circumstances that may occur with different items, but the general format must be followed. If there are items that cannot be documented according to the following illustrations, please call Headquarters Construction for assistance.

Any items requiring measurements, or final quantity calculations must be shown in the field book or on a CALCULATION sheet (Form No. 040-034) and filed in the CALCULATION book as illustrated in Chapter 2 (Setting up a Contract, Book Format, etc.). Make sure to cross reference the quantity in the field book to the CALCULATION sheet and the CALCULATION sheet to the field book(s) and page(s).

										FED. RD. RECD. NO.	STATE	PROJECT NO.	COUNTY	SHEET NO.							
										8	NEVADA	STP-016001B1	CLARK	SD-57							
										<b>STRUCTURE LIST-DRAINAGE</b>											
										DESCRIPTION	STATION TO STATION										
											<b>NOTE: ALL LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED BY THE ENGINEER</b>										
										2.00	2.00	377	1	72	61	1.02	6	14	7	CONSTRUCT TYPE 3 DI, 59.50' LT, H=3.45' INSTALL 18" X 72.33' RCP W/SAFETY SLOPE END SECTION LT. INSTALL CLASS 150 RIPRAP APRON LT CONNECT TO EARTHEN DITCH (SEE SHEET SD-19)	"BD" 19+21.80
												377		30	60	0.99	7	11		CONSTRUCT TYPE 3 DI, 59.50' LT, H=3.35' INSTALL 18" X 30.00' RCP CONNECT TO STRUCTURE 2.1 (SEE SHEET SD-19)	"BD" 19+54.30
												377		30	59	0.98	7	10		CONSTRUCT TYPE 3 DI, 59.50' LT, H=3.26' INSTALL 18" X 30.00' RCP CONNECT TO STRUCTURE 2.2 (SEE SHEET SD-19)	"BD" 19+88.37
												367		63	178	2.28	12	21		CONSTRUCT TYPE 11 DI, 59.50' LT, H=3.26', L=12' INSTALL 18" X 69.03' RCP CONNECT TO STRUCTURE 2.3 (SEE SHEET DS-19)	"BD" 20+58.36

It is important that all records be kept in a neat and legible manner. All **notes in the remarks column must be initialed** by the person or persons responsible for the entry. All **calculations must be checked and initialed by the checker.**

**DOCUMENTATION REQUIREMENT  
SECTION B  
PIPE, RCB, MISC STRUCTURES,  
RETAINING, SOUND, AND MSE WALLS  
(INDEX AND INITIAL KEY)**

Below are illustrations of an index and an initial key. When setting up a field book at the beginning of a contract make sure each item in the book is listed on the index. During the contract if anything is added to the book make sure it is placed on the index. At job closeout make sure the index has the ending page for each item listed on more than one page. Make sure to list the book recap page(s) on the index. If room permits skip a line between entries on the index. Check the initial key each progress payment to assure that everyone who has made entries in the book has initialed and signed the initial key. If the signature is not legible, have the person print his/her name under the signature. Make sure the initials used throughout the book match the way the initials show on the initial key. If the initials change, add the new initials to the initial key next to the original initials.

Use when multiple areas or structures are placed in a book.



Index		Initial Key		
Page	Description	Initials	Signature	Title
4-30	'BD' 19+21.80 LT	JS	Shelli Jones	Tech III
32-53	'BD' 19+54.30 LT	PS	Pat Stewart	Super I
55-73	'BD' 19+88.37 LT	TC	Terri Carson	Tech I
75	Book Recap			

Use when only one area or structure is placed in a book.



Index		Initial Key		
Page	Description	Initials	Signature	Title
4-8	Stakeout Data Sound wall #1	DS	Donna Johnston	Tech II
10-12	Structure Excavation	TJ	Tom Jones	Tech IV
14-16	Granular backfill	SF	Sally Fields	Tech III
18-22	Class A Concrete (mod) (maj)			
24-30	Reinforcing Steel			
32-40	Sound Barrier wall			
75	Book Recap			

**DOCUMENTATION REQUIREMENT  
SECTION C  
PIPE, RCB, MISC STRUCTURES,  
RETAINING, SOUND, AND MSE WALLS  
(STAKEOUT DATA)**

The **Officeperson** will complete the headings on the Stakeout Data page as illustrated below. On PIPE books only, place Pipe Staked, Stakeout Calcs, Pipe restaked, date and Insp as illustrated below. On all other books place staked or Str. staked, date, and initials as illustrated in Chapter 12 (Major Structures) and Chapter 16 (Guardrail Items).

Be sure to allow adequate space in the book before setting up the next section (Construction Record). As shown in the structure list of the plans, the full description shall be placed at the top of the Stakeout Data page as illustrated below.

**If the stakeout is to be performed by NDOT then the Stakeout Data section must contain all the stakeout data, including cross-sections, all grade elevations, cuts and fills, sketches, lengths of pipe or RCB required, etc.** The person entering the stakeout data must date and initial the page(s) and initial and sign the initial key.

When stakeout information is located elsewhere, the Stakeout Data section must make reference to the page and book number of the stakeout information and the stakeout information must be referenced to the page of the appropriate book as illustrated below.

If the structure is not staked, it must be noted on the Stakeout Data page and initialed as illustrated in Chapter 16 (Guardrail Items).

Per subsection 200.01.01 of the contract documents, if the structure is to be engineered by the Contractor, it must be noted in the Stakeout Data section, as illustrated in Chapter 12 (Major Structures). **The Contractor's stakeout information must be given to the Resident Engineer before the final pickup, which will become part of the contract documents forwarded to the Engineering Files.**

"BD" 19+21.80 Construct Type 3 DI,  
59.50' LT, H=3.45'  
Install 18" x 7<sup>1</sup>/<sub>2</sub>' RCP w/safety  
Slope End Section LT  
Install Class 150 Rip Rap Apron LT  
Connect To Earthen Ditch  
(see Sheet SD-19)

4

Stakeout Data

See Survey Calc book p.20

	Date	Insp
Pipe Staked	9-1-08	PS
Stakeout Calcs	9-1-08	PS
Pipe Restaked	9-15-08	PS

**Note: Any changes made during installation of the structure such as changed pipe lengths, revised stationing, etc. shall be shown in the structure description by crossing out the old data and writing in the new data.**

**Contractor Engineered may be handwritten or a stamp may be used.**

**Additional structure installations resulting from change orders shall be documented exactly as described for planned installations. The change order number must be reference at the top of the page with the description.**

**DOCUMENTATION REQUIREMENT  
SECTION D  
PIPE, RCB, MISC STRUCTURES,  
RETAINING, SOUND, AND MSE WALLS  
(CONSTRUCTION RECORD)**

The Construction Record section of the PIPE, RCB, (DRAINAGE), MISC STR, and RETAINING, SOUND, OR MSE WALL book shall be used to document the various items of work performed at each structure installation except 201 and 202 removal items, as illustrated in Chapter 4 (Removal Items).

**While quantities for structure excavation, granular backfill, concrete, reinforcing steel, and structural steel may be based on planned quantity, all each items must be counted and documented and linear foot items must be measured and documented. If the length of pipe or RCB placed differs three feet (3') or more from plan quantity, all quantities affected by the difference must be recalculated or prorated based on the original quantities, with an explanation and cross-reference to the page where the item was either lengthened or shortened three feet (3') or more. Structure excavation and concrete backfill will not be measured for payment on slotted corrugated metal pipe drains.**

See Chapter 25 (Calculations and Reports) for examples of calculations and prorations.

Example of a proration:

Pipe plan = 40 linft

Pipe field measure = 45 linft

Structure Excavation plan = 120 cuyd

$45 \div 40 = 1.125 \times 120 = 135$  cuyd new quantity for structure excavation

Any items requiring measurements, percentages, or final quantity calculations must be shown in the field book or on a CALCULATION sheet (Form No. 040-034) and filed in the CALCULATION book as illustrated in Chapter 2 (Setting up a Contract, Book Format, etc.). Make sure to cross reference the quantity in the field book to the CALCULATION sheet and the CALCULATION sheet to the field book(s) and page(s).

**There has been some question concerning final quantities for RCP when there is "creep" or a gain in length due to the joints for the sections of pipe not fitting together tightly. The final pay quantity for RCP shall be the length of pipe as staked, even though the final length in the field may be slightly more due to "creep".**

**Note:** When RCP is laid between two-drop inlets, the final quantity shall be the length as measured between the DI's. **Care must be taken when documenting RCP to show the length placed that you intend to pay** (i.e. if two DI's 31 feet apart are to be joined by an RCP, it may take only 9 three-foot sections to join them. The documentation in this case should state that 31 feet of RCP was placed). Section lengths should not be mentioned because this introduces a conflict in the documentation.

**Note:** When installing pipe with metal end sections, care should be taken when measuring for payment of structure excavation and granular backfill. **Do not** include the length of the end section in the measurement. These quantities are included in the price of the end section. (Refer to Standard Plans for Road and Bridge Construction, Silver book.) Structure excavation and granular backfill pay limits stop at the end of the length of pipe, not where the Contractor excavates to install the metal end section.

Each book shall be setup as illustrated in Chapter 2 (Setting up a Contract, Book Format, etc.) and recapped as illustrated in Chapter 24 ("Finaling Out" a Contract).

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**PIPE, RCB, MISC STRUCTURES,  
RETAINING, SOUND, AND MSE WALLS  
(CONSTRUCTION RECORD)  
(WHEN PAID BY SQUARE YARD AND SQUARE FOOT)**

Pipe, RCBs, (drainage) and miscellaneous structure items shall be documented in a PIPE, RCB, (DRAINAGE), or MISC STR book. Retaining, sound and MSE wall items shall be documented in a RETAINING, SOUND, or MSE WALL book similar to pipe.

The following is an illustration for an item with a UOM of Sqyd.

The illustration below is located on a structure list from the contract plans as shown on page 13-1.

The **Officeperson** shall complete for each page the item number, item description, plan quantity this installation, the significant figure on the top right-hand side of the page, all column headings, and the page total in the bottom left-hand corner of the page. **Skip at least one line between entries. A separate page shall be provided for each bid item. Make sure to leave enough pages between items for any added or missed items. All calculations must be checked and initialed.**

Daily, the **Inspector** shall document the location, sqyd, date, initials, AEB#, calculations, and any remarks that are needed. **Skip at least one line between entries.**

**Note:** The same format may be used when the UOM is Sqft. The sqyd column shall be changed to the heading of sqft. All entries must be entered as called out in the plans and document left, right, or centerline, where applicable. Items related to sound and MSE walls (walls, concrete stain, etc.) that have a UOM of Sqyd may be paid to plan. If different than plan, calculations are required.

**Payment for Sqyd or Sqft items will be based on field measure and calculations.**

Item No: 2030656				Sig Fig = .1		8
Item: Geotextile				L X W = 9 = sqyd		
Plan Qty this installation: 7.0 sqyd				AEB# Pmt#		
Location	Sqyd	Date	Ins	Calcs/Remarks		
"BD" 19+21.80 LT	7.0	9-5-08	TC	4	7 X 9 = 9 = 7.0 ✓ Complete	
Page total						

Calcs for sqft:  
L X W = sqft

**When making out the field books if a required item of work is not illustrated in this chapter, use an illustration that has the same UOM.**

**PIPE, RCB, MISC STRUCTURES,  
RETAINING, SOUND, AND MSE WALLS  
(CONSTRUCTION RECORD)  
(WHEN PAID BY CUBIC YARD AND CUBIC FOOT)**

Pipe, RCBs, (drainage), and miscellaneous structure items shall be documented in a PIPE, RCB, (DRAINAGE), or MISC STR book. Retaining, sound and MSE walls items shall be documented in a RETAINING, SOUND, or MSE WALL book similar to pipe.

The following is an illustration for an item with a UOM of Cuyd.

The illustration below is located on a structure list from the contract plans as shown on page 13-1.

The **Officeperson** shall complete for each page the item number, item description, plan quantity this installation, the significant figures on the top right-hand side of the page, all column headings, and page total in the bottom left-hand corner of the page. **Skip at least one line between entries. A separate page shall be provided for each bid item. Make sure to leave enough pages between installations for any added or missed items. All calculations must be checked and initialed.**

Daily, the **Inspector** shall document the location, cuyd, date, initials, AEB#, calculations, and any remarks that are needed. **Skip at least one line between entries.**

**Note:** The same format may be used when the UOM is Cuft. The cuyd column shall be changed to the heading of cuft. All entries must be entered as called out in the plans and document left, right, or centerline, where applicable. In no case shall the payment for any area exceed the neat amount without authorized changes and/or final measurement. **RipRap items must be field measured and have calculations, CANNOT PAY PLAN.**

**Payment for Cuyd items shall be based on plan quantity or field measure and calculations if different than plan. Payment for Cuft item shall be based on field measure and calculations.**

Item No. 2060500				Sig fig = .01		10
Item: Structural Excavation				L X W X D = 27 = cuyd		
Plan Qty this installation: 14.00 cuyd				AEB#	Pmt#	Calcs / Remarks
Location	cuyd	Date	Insp			
"BD" 19+21.80 LT	14.00	9-8-08	TC	4		Pay plan
"BD" 19+21.80 LT	.78	9-9-08	TC	4		pipe was extended see page 18 (76 ÷ 72) × 14 = 14.78 <i>1/2</i> complete
Page total:						

Calcs for cuft:

L X W X D = cuft

**When making out the field books if a required item of work is not illustrated in this chapter, use an illustration that has the same UOM.**





