

CHAPTER 12
Major Structures and Piling Items

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DOCUMENTATION REQUIREMENT SECTION A MAJOR STRUCTURES & PILING ITEMS (STRUCTURE LIST)

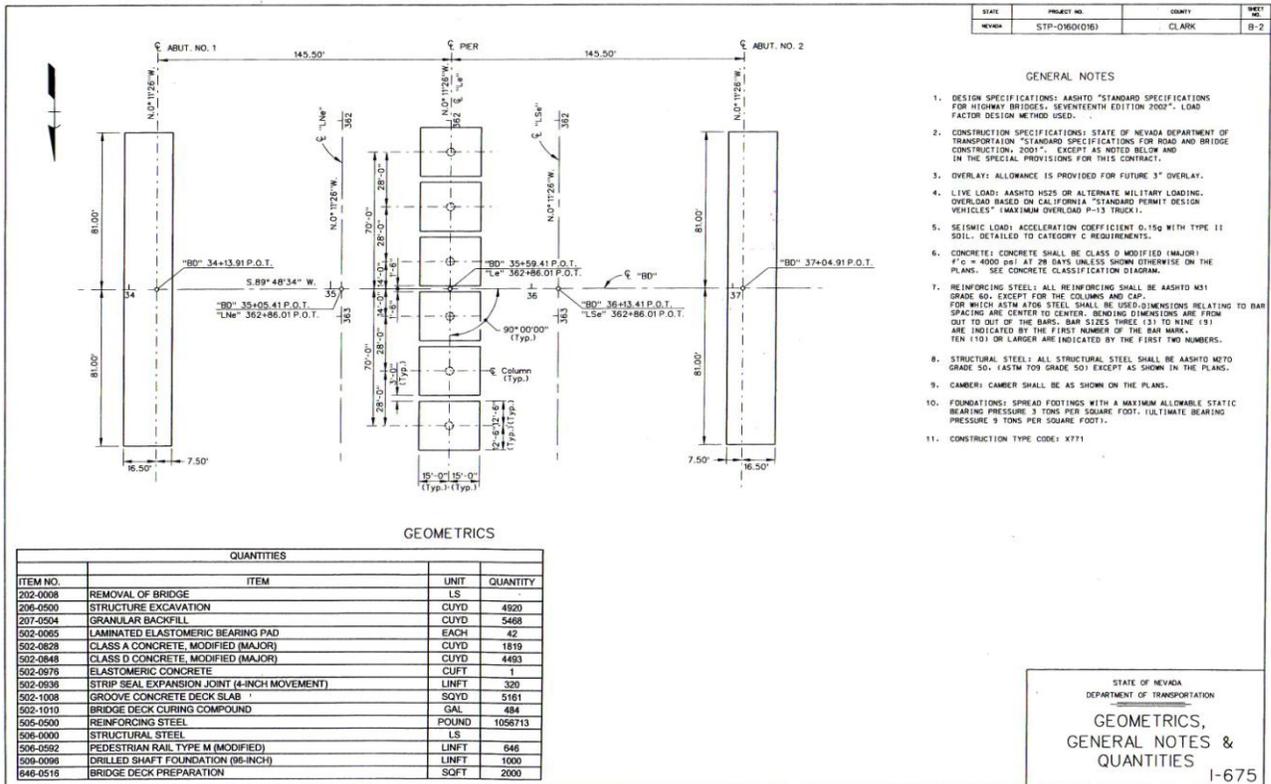
Each major structure shall be documented in a STRUCTURE book. There shall be **one** book for each major structure. The structure number from the contract plans shall also be written on the end of the books. All books shall have two sections - Stakeout Data and Construction Record.

To setup the field books the information on structure items shall be found in the contract plans on the Main Structure list, or on an individual structure's Structure list, or on the Estimate of Quantities. Major structure items should be on a similar structure list as 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.

Each item listed on the structure list will be placed on a separate page in the field book. 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).



**DOCUMENTATION REQUIREMENT
SECTION C
MAJOR STRUCTURES
(STAKEOUT DATA)**

The **Officeperson** will complete the headings on the Stakeout Data page as illustrated below.

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

If the structure is to be staked by NDOT, then the Stakeout Data section must contain all the stakeout data for the structure, cross-sections, and all grade elevations pertinent to the structure, etc. Due to the complexity of major structures, **adequate space must be allowed in the books prior to setting up section two (Construction Record).** 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 book as illustrated in Chapter 13 (Pipe, RCB, Misc Str. or Retaining, Sound, and MSE Wall).

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 below. **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.**

DD' 34+13.91 P.O.T. to 'BD' 37+04.91
Construct Structural Steel Interchange
(Str. No. I-675)

Stake out Data

Contractor Engineered

Str. Staked Date Insp

4

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

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**DOCUMENTATION REQUIREMENT
SECTION D
MAJOR STRUCTURES
(CONSTRUCTION RECORD)**

The Construction Record section shall have a separate page for each bid item listed on the structure list and/or bridge plan sheets relative to that structure. **Make sure to leave enough pages between areas for added or missed items.**

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).

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.**

Partial payments may be made on a progress payment on structural items as described in subsection 109.06 of the contract documents.

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).

CONSTRUCTION RECORD (WHEN PAID BY CUBIC YARD AND CUBIC FOOT)

Structure items shall be documented in a **STRUCTURE** book.

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 12-1.

The **Officeperson** shall complete for each page the item number, item description, plan quantity, 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 items 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. When paying for concrete, payment shall be paid according to the Bill of Materials. If the quantity is different, then calculations are needed. An illustration of a Bill of Materials is shown on page 12-9. **Make sure to keep like areas together.**

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.

Location	cuyd	Date	Insp	Att#	Pmt#	Calcs/Remarks
Item No. 502 0848 Item: Class D Concrete, (mod) (maj) Plan Qty: 4493.00 cuyd						
Abut #1	962.06	9-16-08	JD	3		per bill of materials plan sheet B-44
Abut #2	948.04	9-16-08	JD	3		22X 17.90X 65 / 27 = 948.04
Sig Fig = .01 30 L X W X D = 27 = Cuyd						
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.

CONSTRUCTION RECORD (WHEN PAID BY GALLON)

Structure items shall be documented in a **STRUCTURE** book.

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

The illustration below is located on a structure list from the contract plans as shown on page 12-1.

The **Officeperson** shall complete for each page the item number, item description, plan quantity, 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 items for any added or missed items. All calculations must be checked and initialed and a picture of the label has been taken and placed on a CALCULATION sheet (Form No. 040-034).**

Daily, the **Inspector** shall document the location, #drums (number of drums), gal, date, initials, AEB#, calculations, and any remarks that are needed. **Skip at least one line between entries.** Take a picture of the label from the delivered container, attach to a CALCULATION sheet (Form No. 040-034), and place in the CALCULATION book. This will be the backup to confirm the quantity of the container. Make sure to cross reference the CALCULATION sheet to the field book(s) and page(s) and the field book(s) to the CALCULATION sheet.

Note: All entries must be entered as called out in the plans and document left, right, or centerline, where applicable. **Calculations will consist of counting drums used or measuring the container and calculating the quantity when a full drum is not used, or if measured by another device showing calculations on how the gallons were derived.**

Payment for Gallon items shall be based on field measure and calculations.

Item No. 502 1010				Sig figs: 1			48
Item: Bridge Deck Curing Compound				The picture of the label from the container must be attached to a calc sheet & placed in the Calc Book.			
Plan Qty: 484 gal.							
Location	*Drums	gal.	Date	Insp	AEB*	Pmr*	Calcs /Remarks
Approach Slab #1	2.55	140	9/25/08	JD	3		$140 / 55 = 2.55$ ✓ See calc sheet #17
Approach Slab #2	2.82	155	9/27/08	JD	3		$155 / 55 = 2.82$ ✓ See calc sheet #17
Page total:							

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.

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CONSTRUCTION RECORD (WHEN PAID BY POUND)

Structure items shall be documented in a **STRUCTURE** book.

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

The illustration below is located on a structure list from the contract plans as shown on page 12-1.

The **Officeperson** shall complete for each page the item number, item description, plan quantity, 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. If the item comes in a container or bag, place a note at the top of the page, as illustrated on page 12-7. **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 and a picture of a label has been taken and placed on a CALCULATION sheet (Form No. 040-034).**

Daily, the **Inspector** shall document the location, lbs, date, initials, AEB#, calculations, and any remarks that are needed. **Skip at least one line between entries.** If the item comes in a container or bag, take a picture of the label from the delivered container, attach to a CALCULATION sheet (Form No. 040-034), and place in the CALCULATION book. This will be the backup to confirm the quantity of the container. Make sure to cross reference the CALCULATION sheet to the field book(s) and page(s) and the field book(s) to the CALCULATION sheet.

Note: All entries must be entered as called out in the plans and document left, right, or centerline, where applicable. **When paying for reinforcing steel, payment shall be paid according to the Bill of Materials.** If quantity is different, then calculations are needed. An illustration of a Bill of Materials is shown on page 12-9. **Make sure to keep like areas together.**

Payment for Pound items shall be based on plan quantity or field measure and calculations if different than plan.

Item No. 5050500				Sig Fig = 1		51
Item: Reinforcing Steel						
Plan Qty: 1056773 pound						
Location	Lbs	Date	Insp	AEB#	Print#	Calcs/Remarks
Abut #2	45957	9-22-08	JD	3		130734 X .35 = 45956.90 35% complete
Abut #1	65400	9/22/08	JD	3		130800 X .5 = 65400 50% complete
Abut #1	65400	9/25/08	JD	3		130800 - 65400 = 65400 100% complete
Page total:						

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.

**DOCUMENTATION REQUIREMENT
SECTION F
MAJOR STRUCTURES
(PILING DRIVING ITEMS)
(Form No. 040-058)**

The **Inspector** shall prepare the FOUNDATION PILING DRIVING RECORD.

The total number of piles placed is the pay quantity for Driving Piles **paid by each**.

The total length for payment is the pay quantity for Furnish Piles **paid by linft**. The Length for Payment = Cut-off elevation minus (-) tip elevation. Check the Contract Plans for exact cut-off elevations.

The number of splices listed in the two columns on the form is used to list separately the number spliced at the Contractor's expense and the number paid for by NDOT. This item is **paid by each**. An explanation is required if a splice is needed.

The **Inspector** shall document any remarks pertinent to each individual pile in the appropriate section, sign the FOUNDATION PILING DRIVING RECORD and submit to the field office daily. All totals shall be checked for mathematical accuracy and signed by the person who checked the form. The Resident Engineer will review and sign the form.

The original form shall be sent to Headquarters Construction Quality Assurance and a copy shall be filed in Section 2-Material and Testing File, Division No. 9 as described in Chapter 1, (Organization of Project).

If there are any questions concerning the FOUNDATION PILING DRIVING RECORD (Form No. 040-058), please contact Headquarters Construction Quality Assurance for assistance.

Forms change periodically, please assure that you are using the most current form available, see Chapter 26 (Distribution of Documents).

Documentation for items listed on the FOUNDATION PILING DRIVING RECORD is illustrated on pages 12-11 and 12-12.

**MAJOR STRUCTURES
(PILING DRIVING ITEMS)
(WHEN PAID BY EACH)**

Structure items shall be documented in a **STRUCTURE** book.

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

The illustration below is located on a structure list from the contract plans.

The **Officeperson** shall complete for each page the item number, item description, plan quantity, 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 items for any added or missed items.**

Daily, the **Inspector** shall document the location, qty (number placed, as shown on the FOUNDATION PILE DRIVING RECORD, Form No. 040-058), date, initials, AEB#, and any remarks that are needed. **Skip at least one line between entries.**

Note: All entries must be entered as called out in the plans and document left, right, or centerline, where applicable. This illustration shall also be used to document number of splices, either State or Contractor, shown on the FOUNDATION PILE DRIVING RECORD.

Payment for Each items will be based on field count.

Item No 508 0012 Item: Drive Steel Piles Plan Qty: 20 Each				Sig Fig = 1 25	
Location	Qty	Date	IRSP	AEB* Pmt#	Remarks
Abut #1	1	9-10-08	TS	6	Pile #1
Abut #1	1	9-10-08	TS	6	Pile #2
Abut #1	1	9-11-08	TS	6	Pile #3
Abut #1	1	9-15-08	TS	6	Pile #4
Page total:					

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.

**MAJOR STRUCTURES
(PILING DRIVING ITEMS)
(WHEN PAID BY LINEAR FOOT)**

Structure items shall be documented in a **STRUCTURE** book.

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

The illustration below is located on a structure list from the contract plans.

The **Officeperson** shall complete for each page the item number, item description, plan quantity, 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.**

Daily, the **Inspector** shall document the location, meas linft (Length for Payment, as shown on the FOUNDATION PILE DRIVING RECORD, Form No. 040-058), date, initials, AEB#, and any remarks that are needed. **Skip at least one line between entries.**

Note: All entries must be entered as called out in the plans and document left, right, or centerline, where applicable.

Payment for Linft items will be based on field measure.

Item No: 508 0512				Sig Fig = 1		28
Item: Furnish Steel Piles						
Plan Qty: 1250 Linft						
Location	meas Linft	Date	Trsp	AEB#	Pmt#	Remarks
Abut #1	39	9-10-08	TS	6		Pile #1
Abut #1	38	9-10-08	TS	6		Pile #2
Abut #1	42	9-11-08	TS	6		Pile #3
Abut #1	82	9-15-08	TS	6		Pile #4 verified by the geotechnical section to keep driving until min. blows per foot are reached.
Page total:						

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.

**DOCUMENTATION REQUIREMENT
SECTION G
MAJOR STRUCTURES
(DRILLED SHAFT INSPECTION ITEMS)
(Form No. 040-060)**

The **Inspector** shall prepare the DRILLED SHAFT INSPECTION REPORT. The DRILLED SHAFT CONCRETE VOLUMES (back of the form) is required unless the Special Provision for the contract states otherwise.

The **Inspector** shall document any remarks pertinent to each individual pile in the appropriate section, sign the DRILLED SHAFT INSPECTION REPORT and submit to the field office daily. The Resident Engineer will review the form and sign.

The original form shall be sent to Headquarters Construction Quality Assurance and a copy shall be filed in Section 2-Material and Testing File, Division No. 9 as described in Chapter 1 (Organization of Project).

Note: The length for pay in the DESIGN section and the total length paid in the AS-BUILT section shall match, **if they do not, an explanation is required.**

The CONCRETE PLACEMENT LOG AND GRAPH form will replace the back of the DRILLED SHAFT INSPECTION REPORT (Form No. 040-060) and will be completed by the Contractor **if directed to do so in the Special Provision of the contract.**

Forms change periodically, please assure that you are using the most current form available, see Chapter 26 (Distribution of Documents).

Documentation for the lift item listed on the DRILLED SHAFT INSPECTION REPORT is illustrated on page 12-14.

**MAJOR STRUCTURES
DRILLED SHAFT INSPECTION ITEMS
(WHEN PAID BY LINEAR FOOT)**

Structure items shall be documented in a **STRUCTURE** book.

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

The illustration below is located on a structure list from the contract plans.

The **Officeperson** shall complete for each page the item number, item description, plan quantity, 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.**

Daily, the **Inspector** shall document the location, meas linft (AS-BUILT-Total length paid, as shown on the DRILLED SHAFT INSPECTION REPORT, Form No. 040-060), date, initials, AEB#, and any remarks that are needed. **Skip at least one line between entries.**

Note: All entries must be entered as called out in the plans and document left, right, or centerline, where applicable.

Payment for Linft items will be based on field measure.

Item No. 509 0096				Sig Fig = 1		62
Item: Drilled Shaft Foundation (96-inch)						
Plan Qty: 1000 Linft						
location	meas Linft	Date	IRSD	AEB#	Pmt#	Remarks
Pier 1	80	9-01-08	JD	3		
Page total:						

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.