

# **MAJOR STRUCTURE AND PILING ITEMS**

This chapter contains the following sections:

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<b>Overview .....</b>	<b>13-3</b>
<b>Inspector's Responsibilities – Major Structure and Piling Items .....</b>	<b>13-3</b>
<b>Office Engineer's Responsibilities – Major Structure and Piling Items .....</b>	<b>13-13</b>



## OVERVIEW

Structure and Piling Items have different documentation requirements for each unit of measure (UOM). All Structure and Piling Items must be counted, measured and/or calculated. Documentation examples for a few selected Structure and Piling Items are illustrated in this chapter. Some minor modifications may be required to show the unusual circumstances that may occur with different items, but the general format should be followed. If there are items which cannot be documented according to the following examples, contact the Construction Admin Services Section for assistance.

**Note:** Forms change periodically, go to the [NDOT Website Construction Forms](#) Area for the latest version.

Per Subsection 200.01.01, (Construction Stakeout) General, of the Standard Specifications, the Contractor will be responsible for stakeout data on major structures. The Contractor's stakeout information must be given to the Resident Engineer.

When material samples are taken for the Materials Division labs, refer to the [AWP Sample Records](#) document for details.

## INSPECTOR'S RESPONSIBILITIES – MAJOR STRUCTURE AND PILING ITEMS

- Use the Agreement Estimate report as a reference to ensure that items and quantities are paid in the correct category (AEB).
- Use the Geometrics, General Notes and Quantities Sheet (Figure 13-1), located in the Contract plans, to help identify items, quantities, descriptions and locations.

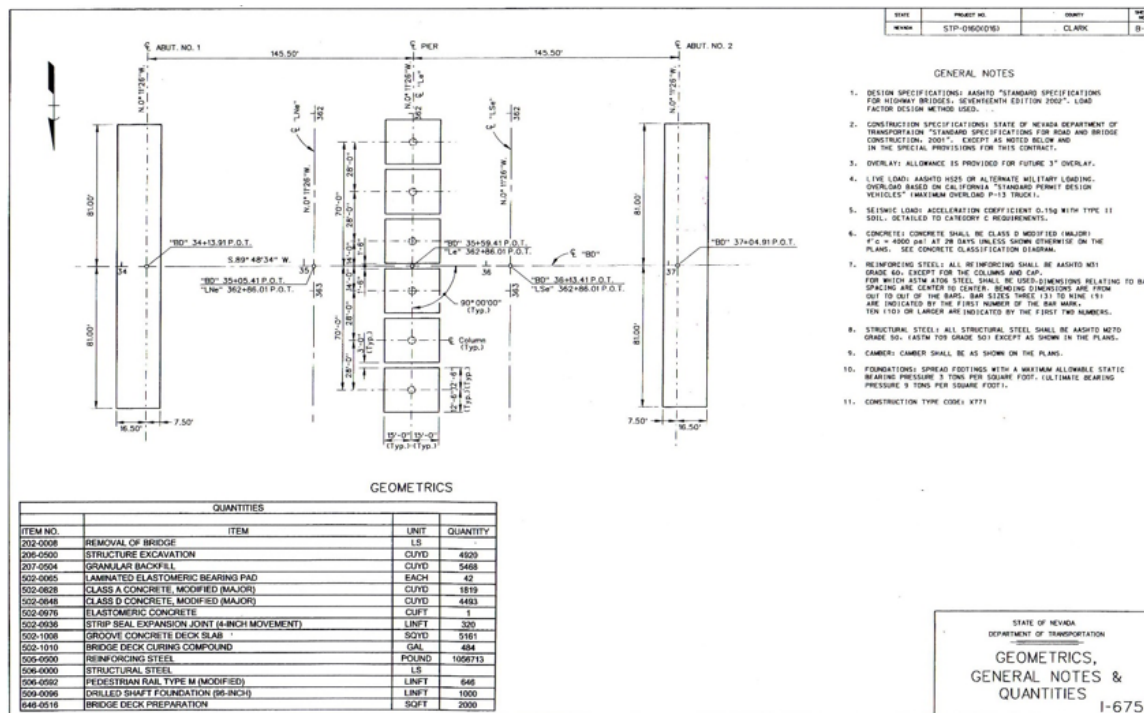


Figure 13-1: Example of a Geometrics, General Notes and Quantities Sheet

- Review the following for accuracy:

- Special Provisions
- Supplemental Notices
- Change Orders

**Note:** When any changes are made to an item, reference the Change Order number in the DWR item posting remarks.

- Turn in ALL structure item calculation sheets to the Office Engineer.

## DAILY WORK REPORT (DWR) – MOBILE INSPECTOR

1. Create a DWR in Mobile Inspector daily to document the activity being monitored. Refer to the [Mobile Inspector User Guide](#) for details on using this application.
  - Report Details – daily activities
  - Item Postings – item(s) and quantity(s)
  - Equipment – type, number and hours used
  - Personnel – title and hours
2. Record the following required information in the Report Details window (Figure 13-2):
  - **Date**
  - **Weather**
  - **Low Temp** and **High Temp**
  - **Attachments:** (N/A) Send ALL photos via email.
  - **Remarks:** Select the appropriate Remark Type. Verify with the Resident Engineer on what information is required.

Figure 13-2: DWR Report Detail Window

3. Record the following required information in the New Item Postings window:
  - **Item:** Select the appropriate Project/Catg., if item is in more than one Project/Catg. – Refer to the AEB report.
  - **Contractor:** ALWAYS the Prime Contractor (Subs are not allowed).
  - **Qty:** Based on plan, measurements and calculations
  - **Material Set:** Select appropriate value (if applicable)
  - **Location:** Line Designation
  - **Station From/To:** Refer to Contract plans.
  - **Offset Type:** Enter the LT, RT, or CL.

- **Offset Dist.:** Enter if known.
- **Comments:** Must show calculations when appropriate, refer to Calculation Sheet when appropriate (refer to Appendix B, Calculation Formulas, in this Manual for a Calculation Sheet example), other information relevant to item posting, and explanations when Attention Flag is checked.
- **Attention Flag:** Use to bring attention to Resident Engineer and Office Engineer for overruns and plan errors. Must enter Attention Comments.

NOTES for Major Structure and Piling item postings:

- If an each item has a specific location/station callout in the plans, then a separate posting will be done. It should NOT be grouped in a posting.
- If each items do NOT have a location/station callout but are grouped in a table or structure list, then they can be combined in one posting.
- Refer to Figure 13-3 through Figure 13-10 for examples of Structure and Piling Item postings with different UOM.
- If a gallon item does not come in small size containers use the application and surface area to calculate the gallons applied. The following calculation will be documented in the DWR posting:
  - $Vol(gas) = W \times L \times App\ Rate$
  - Pay = # gallons
  - W = #
  - L = #
  - App Rate = 1gal/150 SQFT (Per Subsection 409.03.13, (Portland Cement Concrete Pavement) Construction – Curing, of the Standard Specifications.
- The Inspector will visually make sure the coverage of the cure compound was satisfactory.

**New Item Posting**

<b>Item:</b>	CLASS D CONCRETE (M... ▾)
<b>Contractor:</b>	Q&D CONSTRUCTION INC ▾
<b>Qty:</b>	960.06 CUYD
<b>Authorized:</b>	1,250.000 CUYD
<b>Total Posted:</b>	0.000 CUYD
<b>Location:</b>	Abut. # 1 (Str. I-675)
<b>Station From:</b>	[ ] + [ ]
<b>Offset Type:</b>	[ ]
<b>Offset Dist:</b>	[ ]
<b>Station To:</b>	[ ] + [ ]
<b>Offset Type:</b>	[ ]
<b>Offset Dist:</b>	[ ]
<b>Measured:</b>	[ ]
<b>Comments:</b>	Per Bill of Materials, Plan sheet B-44 100% Complete

3959 remaining

Figure 13-3: DWR Item Posting - Structure CUYD

NOTES for Structure CUYD/CUFT (Figure 13-3):

- Payment for CUYD items will be based on plan quantity or field measurements and calculations if different than plan. Payment for CUFT items will be based on field measurements and calculations.
- Calculations for CUYD =  $L \times W \times D \div 27$
- Calculations for CUFT =  $L \times W \times D$
- Location: Refer to Contract plans
- Sig. Fig. = .01
- In no case will the payment for any area exceed the net amount without authorized changes and/or final measurement. When paying for concrete, payment will be paid according to the Bill of Materials (Figure 13-6). If the quantity is different, then calculations are needed.

**New Item Posting**

**Item:** BRIDGE DECK CURING...  
**Contractor:** Q&D CONSTRUCTION INC  
**Qty:** 110.00 GAL  
 Authorized: 235.000 GAL  
 Total Posted: 95.000 GAL  
**Location:** Approach Slab # 1  
**Station From:** [ ] + [ ]  
**Offset Type:** [ ]  
**Offset Dist:** [ ]  
**Station To:** [ ] + [ ]  
**Offset Type:** [ ]  
**Offset Dist:** [ ]  
**Measured:** [ ]  
**Comments:**  
 2 Drums @ 55 gal. = 110.00 gal.  
 3966 remaining  
**Attention:**   
**Attention Comments:**  
 See email: DWR 2019-6-7 CAW for container label.  
 208 remaining

Figure 13-4: DWR Item Posting - Structure GAL

NOTES for Structure GAL (Figure 13-4):

- Payment for GAL items will be based on field measurements and calculations.
- Calculations will consist of counting the drums used or measuring the container and calculating the quantity when a full drum is not used. If measured by another device show the calculations on how gallons were derived.
- A picture of a label must be taken and email to your Office Engineer for backup to confirm the quantity of the container. This photo is saved to the appropriate Contract Files\Contract\07 Estimates directory.
- Location: Refer to Contract plans
- Sig. Fig. = .01
- Check the Attention Flag to notify the Office Engineer there's email that belong with this Item Posting

**New Item Posting**

**Item:** REINFORCING STEEL  
**Contractor:** Q&D CONSTRUCTION INC  
**Qty:** 45765.90 LB  
 Authorized: 130,734.000 LB  
 Total Posted: 0.000 LB  
**Location:** Str. I-675 Abut. # 2  
**Station From:** [ ] + [ ]  
**Offset Type:** [ ]  
**Offset Dist:** [ ]  
**Station To:** [ ] + [ ]  
**Offset Type:** [ ]  
**Offset Dist:** [ ]  
**Measured:** [ ]  
**Comments:**  
 Per Bill of Materials, Page B44  
 35% completed  
 $130734 \times .35 = 45765.90 \text{ lbs.}$   
 3923 remaining

Figure 13-5: DWR Item Posting - Structure LB

NOTES for Structure LB (Figure 13-5):

- Payment for POUND (LB) for Reinforcing Steel is based on the Bill of Materials (Figure 13-6). If plan quantity is different, field measurements and calculations (per Subsection 505.04.01, (*Reinforcing Steel*) *Measurement*, of the Standard Specifications) are required.
- Location: Refer to Contract plans
- Sig. Fig. = .01

# MAJOR STRUCTURE AND PILING ITEMS

Item		Quantity	Unit	Price	Total
12891.48 lb.					
4876.03 lb.					
4038.33 lb.					
11400.93 lb.					
10465.20 lb.					
6568.80 lb.					
2255.47 lb.					
4831.29 lb.					
12020.96 lb.					
2975.85 lb.					
2331.71 lb.					
335.50 lb.					
1423.50 lb.					
1358.77 lb.					
41.72 lb.					
652.50 lb.					
2483.93 lb.					
3553.33 lb.					
2483.93 lb.					
5622.75 lb.					
1396.12 lb.					
22.53 lb.					
22.25 lb.					
34.07 lb.					
13.91 lb.					
21.80 lb.					
23.29 lb.					
70.05 lb.					
99.61 lb.					
39.29 lb.					
130800.20 lb.					
960.06 C.Y.					
5.53 7					
5.33 7					
5.13 7					
5.53 7					
5.13 5					
5.22 4					
5.13 6					
5.13 6					
5.05 1					
6.07 0					
9.22 6					
6.22 6					
5.06 6					
9.18 3					
9.10 3					
9.39 8					
5.29 6					
10.2 3					
6.23 6					
5.06 10					
9.10 3					
9.18 9					
5.14 8					
4.15 4					
4.03 5					
5.15 5					
6.05 11					
5.07 11					
6.05 4					
5.16 8					
6.14 9					
5.26 2					
5.52 9					
6.15 6					
5.17 3					
6.14 11					
5.26 0					
6.15 0					
5.26 5					
7 0					
22 6					
22 6					
18 3					
10 3					
39 8					
19 8					
23 6					
6 10					
10 3					
18 9					
14 8					
15 4					
1 5					
4 3					
15 Bars Per Set					
8 Bars Per Set					
24 Bars Per Set					
15 Bars Per Set					
24 Bars Per Set					
15 Bars Per Set					
21 Bars Per Set					
11 Bars Per Set					

Figure 13-6: Example of a Bill of Materials Sheet

**New Item Posting**

**Item:**

**Contractor:**

**Qty:**  SQYD

Authorized: 4,000,000 SQYD  
Total Posted: 835,500 SQYD

**Location:**

**Station From:**  +

**Offset Type:**

**Offset Dist:**

**Station To:**  +

**Offset Type:**

**Offset Dist:**

**Measured:**

**Comments:**

3971 remaining

- NOTES for Structure SQYD/SQFT (Figure 13-7):**
- Payment for SQYD and SQFT items will be based on field measurements and calculations.
  - Calculation for SQYD = L x W ÷ 9
  - Calculation for SQFT = L x W
  - Location: Enter the Line Designation
  - Station From/To: Refer to Contract plans
  - Offset Type: Enter the LT, RT, or CL.
  - Offset Dist: Enter if known
  - Sig. Fig. = .01

Figure 13-7: DWR Item Posting – Structure SQYD

**New Item Posting**

**Item:** DRIVE STEEL PILES

**Contractor:** Q&D CONSTRUCTION INC

**Qty:** 1.00 EACH  
**Authorized:** 4.000 EACH  
**Total Posted:** 2.000 EACH

**Location:** Abut. 1 (Str. I-675)

**Station From:**   +  

**Offset Type:**  

**Offset Dist:**  

**Station To:**   +  

**Offset Type:**  

**Offset Dist:**  

**Measured:**  

**Comments:**

File # 2

3991 remaining

**Attention:**

**Attention Comments:**

See Foundation Pile Driving Record from dated 7/8/2019

202 remaining

NOTES for Piling EACH (Figure 13-8):

- Prepare the Foundation Piling Driving Record (Form 040-058).
- Payment for EACH item will be based on the Total Number Placed value from the 040-058 form.
- Location: Refer to Contract plans
- Sig. Fig. = .01
- If there are any questions concerning the Foundation Piling Driving Record (Form No. 040-058), contact Materials Division, Geotechnical Section for assistance.

Figure 13-8: DWR Item Posting – Piling EACH



**New Item Posting**

**Item:** FURNISH STEEL PILES (...)

**Contractor:** Q&D CONSTRUCTION INC

**Qty:** 82.00 LFT

**Authorized:** 200.000 LFT

**Total Posted:** 75.000 LFT

**Location:** Abut. 1 (Str. I-675)

**Station From:**   +  

**Offset Type:**  

**Offset Dist:**  

**Station To:**   +  

**Offset Type:**  

**Offset Dist:**  

**Measured:**

**Comments:**

Pile # 4

3989 remaining

**Attention:**

**Attention Comments:**

Verified by the Geotechnical section to keep driving until min. blows per foot are reached. See Foundation Pile Driving Record from 6/7/19

117 remaining

**NOTES for Piling LFT (Figure 13-9):**

- Prepare the Foundation Piling Driving Record (Form 040-058).
- Payment for LFT item will be based on the Total Length for Payment value from the 040-058 form.
- Location: Refer to Contract plans
- Sig. Fig. = .01
- If there are any questions concerning the Foundation Piling Driving Record (Form No. 040-058), contact Materials Division, Geotechnical Section for assistance.

**Figure 13-9: DWR Item Posting – Piling LFT**

New Item Posting	
<b>Item:</b>	DRILLED SHAFT FOUND... ▾
<b>Contractor:</b>	Q&D CONSTRUCTION INC ▾
<b>Qty:</b>	80.00 LFT
Authorized:	200.000 LFT
Total Posted:	0.000 LFT
<b>Location:</b>	Abut. 1 (Str. I-675)
<b>Station From:</b>	<input type="text"/> + <input type="text"/>
<b>Offset Type:</b>	<input type="text"/>
<b>Offset Dist:</b>	<input type="text"/>
<b>Station To:</b>	<input type="text"/> + <input type="text"/>
<b>Offset Type:</b>	<input type="text"/>
<b>Offset Dist:</b>	<input type="text"/>
<b>Measured:</b>	<input type="checkbox"/>
<b>Comments:</b>	<div style="border: 1px solid black; padding: 5px;">           Pier 1    <span style="float: right;">3993 remaining</span> </div>
<b>Attention:</b>	<input checked="" type="checkbox"/>
<b>Attention Comments:</b>	<div style="border: 1px solid black; padding: 5px;">           See Drilled Shaft Inspection Report dated 6/7/19    <span style="float: right;">208 remaining</span> </div>

Figure 13-10: DWR Item Posting – Drill Shaft LFT

NOTES for Drill Shaft LFT (Figure 13-10):

- Prepare the Drilled Shaft Inspection Report (Form 040-060)
- The LFT for payment is from the Total Length Paid value that is shown on the 040-060 form.
- Location: Refer to Contract plans
- Sig. Fig. = .01
- If there are any questions concerning the Foundation Piling Driving Record (Form No. 040-058), contact Materials Division, Geotechnical Section for assistance.

4. Record the following required information in the New Equipment window (Figure 13-11 and Figure 13-12):
- **Contractor:** Actual contractor performing the work (include subs).
  - **Type:** Select from the Equipment list
  - **Used:** How many of each type.
  - **Hours Used:** Total hours in use.
  - **Comments:** Details of the type of equipment (e.g., diesel, HP, model, make). Include equipment attachment information if applicable.

**New Equipment**

**Contractor:** LAS VEGAS PAVING C...

**Type:** LOADER / BACKHOE /...

**Used:** 1

**On Site:**

**Hours Used:** 8

**Hours Idle:**

**Comments:**

Bobcat 256C, Skid Steer, Diesel, 82HP, 1350lbs with an Auger Loader, attachment, 15C w/12" bit

506 remaining

✓
✗

**Figure 13-11: DWR Equipment Entry**

**Add Equipment**

**Contractor:** LAS VEGAS PAVING CORPORATION

**Type:** LOADER / BACKHOE / WHEEL LOADER / SKID STEER

**Used:** 1

**Hours Used:** 8.000

**Comments:**  
 Bobcat 256C, Skid Steer, Diesel, 82HP, 1350lbs with an Auger Loader, attachment, 15C w/12" bit

✎
🗑

**Figure 13-12: DWR Equipment List**

5. Record the following required information in the New Personnel window (Figure 13-13 and Figure 13-14):
  - **Contractor:** Actual contractor performing the work (include subs).
  - **Type:** Select from the Personnel list.
  - **Number:** How many of each title.
  - **Total Hours:** Total hours worked.
  - **Comments:** Details of personnel type (e.g., foreman w/name, laborer, truck driver).

New Personnel	
Contractor:	LAS VEGAS PAVING C... ▾
Personnel:	LABORER FOREMAN ▾
Employee:	N/A
Decision Class:	Select ▾
Number:	1
Total Hours:	8
Comments:	Foreman - Cody Bellinger
3975 remaining	
<input type="checkbox"/> <input type="checkbox"/>	

Figure 13-13: DWR Personnel Entry

Add Personnel	
<b>Contractor:</b> LAS VEGAS PAVING CORPORATION <b>Description:</b> LABORER <b>Number:</b> 3 <b>Total Hours:</b> 8.000	<input type="checkbox"/> <input type="checkbox"/>
<b>Contractor:</b> LAS VEGAS PAVING CORPORATION <b>Description:</b> OPERATING ENGINEER <b>Number:</b> 2 <b>Total Hours:</b> 8.000	<input type="checkbox"/> <input type="checkbox"/>
<b>Contractor:</b> LAS VEGAS PAVING CORPORATION <b>Description:</b> LABORER FOREMAN <b>Number:</b> 1 <b>Total Hours:</b> 8.000 <b>Comments:</b> Foreman - Cody Bellinger	<input type="checkbox"/> <input type="checkbox"/>

Figure 13-14: DWR Personnel List

- Complete a final review of the DWR, lock the report, and Sync Data.

**Note:** When a Mobile Inspector DWR is completed, locked and Synd Data is completed, the information is uploaded into an AWP DWR, where it is reviewed and Approved for processing progress payments.

## DAILY WORK REPORT (DWR) – AWP EDITS

The Officer Engineer reviews each Inspector's DWRs for required entries and accuracy. If edits are needed on a DWR, the Inspector who created it may be required to log into the AWP program on a computer (not the iPad) and complete the edits. Refer to Chapter 5, Daily Work Reports, Section, Editing a Mobile Inspector DWR, in the [AWP User Guide](#) for details.

## OFFICE ENGINEER'S RESPONSIBILITIES – MAJOR STRUCTURE AND PILING ITEMS

- Save all contractor's survey stakeout data in the Contract Files\Contract\12 Misc\12.# Stakeout Data directory.
- Collect all Material Certifications. Scan and save them to the Contract Files\Materials\03 Cert & Test Reports\3.# directory. Each Material Certification must have the contract ID, bid item and represented quantity entered. Hand-written entries are acceptable for the contract ID, bid item and quantity.
  - Name the scanned certificate file(s) with the contract ID, Material Code Name & description, load number (if applicable) - CERT (e.g., 03904 M5050100 Reinforcing Steel - CERT.pdf). The Material Code Name and description is found in the NDOT Power BI, AWP Reports, Certification Tracking report.
- Create an AWP Materials Cert Sample Record for each Material Certification received. Refer to the [AWP Cert Sample Record Creation](#) document and Chapter 24, Progress Payments, in this Manual for details.
- Save Structure items general information photos in the appropriate Contract Files\Contract\03 Multimedia\3.# Photos directory.
- Save Structure items Gallon label photos to the appropriate Contract Files\Contract\07 Estimates directory to confirm the quantity of the container.
- Review structure item calculation sheets for accuracy and save electronically in the appropriate Contract Files\Contract\07 Estimates\7.# Calc Sheets directory using this naming convention: DWR YYYY-MM-DD Inspectors Initials, (e.g. DWR 2016-03-19 KMM).
- Review the Foundation Piling Driving Records and Drilled Shaft Inspection Reports for accuracy and save electronically in the appropriate Contract Files\Contract\07 Estimates\7.# Drill Shaft &Piling directory.
- Distribute executed copies of Change Orders to Inspectors.

### DAILY WORK REPORT (DWR) – AWP

When a Mobile Inspector DWR is locked by an Inspector, the information is uploaded into an AWP DWR. Refer to Chapter 5, Daily Work Reports, in the [AWP User Guide](#) for details.

- Verify the following:
  - Information in the Remarks
  - Information in the Contractor On Site tab
  - Information in the Contractor Equipment tab
  - Information in the Contractor Personnel tab
  - Items are paid correctly according to the contract documents (e.g., plans, supplemental notices, Change Orders).
  - Item quantities
  - Quantities in postings are documented to the correct Significant Figure (.01)
  - Material Set is correct.
  - Stations and Line Designations in the Locations
  - Calculations are correct.
  - Comments reference calculation sheets, if applicable.

**Note:** Length does not always equal the difference between the beginning and ending station. Sometimes there is a curve or an obstacle that will affect the distance. Always check with the Inspector before assuming the calculations are incorrect.

- Approve the DWR if everything is correct.
- If there are edits required, the Office Engineer may complete them and add a DWR Note with their name, date, and details of the correction. The DWR can then be Approved.
- If there are edits which need to be completed by the Inspector who created the DWR, the Inspector will be required to log into the AWP program on a computer (not the iPad) to complete the edits.
- Review the edited DWR and Approve.

