# **ELECTRICAL ITEMS**

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## **OVERVIEW**

Electrical Items have different documentation requirements for each unit of measure (UOM). All Electrical Items must be counted and measured. Documentation examples for a few selected Electrical 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.

When material samples are taken for the Materials Division labs, refer to the AWP Sample Records document for details.

## INSPECTOR'S RESPONSIBILITIES - ELECTRICAL ITEMS

- Use the Agreement Estimate report as a reference to ensure that items and quantities are paid in the correct category (AEB).
- Use the Schedules found on the Signals and Lighting sheets (Figure 8-1), located in the Contract plans, to help identify items, quantities, descriptions and locations.

		CONDUIT	RUN S	CHEDUL	:		
CON. RUN	FROM	то	LEN.	PVC	GRD	POW	COMMENTS
RUN			LINE	3"	6	#6	
13 01	POLE 13A	CAB-13o	301	1	1		SOLAR CABLING INCIDENTAL TO SOLAR BID ITEMS.
13 02	CAB-13a	PULL BOX (13a)	20'	1	1	2	
13 03		CHAIN-UP SIGN (146)	30'	1	1	2	
13 04	POLE 13B	CAB-13b	30'	1	1		SOLAR CABLING INCIDENTAL TO SOLAR BID ITEMS.
13 05	CAB-13b	PULL BOX (13b)	20'	1	1	2	
13 06	PULL BOX (13b)	CHAIN-UP SIGN (152)	30'	1	1	2	

								PULL BOX S	CHEDULE		
Γ	N	Э.	5	TATION	OFFSET	LT/R1	EX.	TYPE	LOCKING LID	BURIED	COMMENTS
1	13	0	PE	1031+96	79'	RT		NO. 5 PULL BOX	X		
Г	3	ь	PW	1032+22	63'	LT		NO. 5 PULL BOX	X		

							POLE SO	ΉEI	CULE		
				Р	OLE				-	DEVICES	
NC	Э.	5	STATION	OFFSET	LT/R1	TYPE	SAFETY BASE	EX.	EX.	SOLAR PANELS	COMMENTS
13	Α	PE	1031+90	98'	RT	ITS 30'				2	SOLAR CABLING INCIDENTAL TO SOLAR BID ITEMS.
13	В	PW	1032+28	82'	LT	ITS 30 <sup>i</sup>				2	SOLAR CABLING INCIDENTAL TO SOLAR BID ITEMS.

CABNET LABEL/NAME								CAL	INE I SCHEDU	LE		
CAB-130 PE 1031+96 98' RT ITS 1 1 FOR EASTBOUND CHAIN-UP SIGN.									CABIN	NET EQUIPMEN	T	
	CABINET LABEL/NAME	5	STATION	OFFSET	LT/RT	EX.	TYPE	EX.	FHES	TELEPHONE	BEACON	
CAB-136 PW 1032+22 82' LT ITS 1 1 1 FOR WESTBOUND CHAIN-UP SIGN.	CAB-13a	PE	1031+96	98'	RT		ITS		1	1	1	FOR EASTBOUND CHAIN-UP SIGN.
	CAB-13b	PW	1032+22	821	LT		ITS	Γ	1	1	1	FOR WESTBOUND CHAIN-UP SIGN.

								STREET	LIGHTING LUMINAIRE SCHED	ULE
			POLE						LUMINAIRE	
NO.		STATION	OFFSET	LT/R1	TYPE	EX.E	x. # OF LUM'R	ARM LENGTH	TYPE	COMMENTS
02 0	)1 R1	1+54	5'	RT	7	Х	1	15'	LUMINAIRE (TYPE B) (SL)	REMOVE EXISTING HPS LUMINAIRE, REPLACE WITH LED, USE EXISTING CONDUCTORS.
02 0	2 R1	3+77	5'	RT	7	Х	1	15'	LUMINAIRE (TYPE B) (SL)	REMOVE EXISTING HPS LUMINAIRE, REPLACE WITH LED. USE EXISTING CONDUCTORS.
02 0	3 R1	6+01	5'	RT	7	Х	1	151	LUMINAIRE (TYPE B) (SL)	REMOVE EXISTING HPS LUMINAIRE, REPLACE WITH LED. USE EXISTING CONDUCTORS.
02 0	4 R4	3 <del>+</del> 01	10'	LT	7	X	1	15'	LUMINAIRE (TYPE B) (SL)	REMOVE EXISTING HPS LUMINAIRE, REPLACE WITH LED, USE EXISTING CONDUCTORS.

Figure 8-1: Examples of a Schedules Sheets- Electrical Items

- 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 electrical 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 <u>Mobile Inspector User Guide</u> 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 8-2):
  - 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.

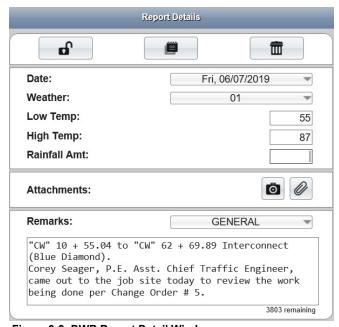


Figure 8-2: DWR Report Detail Window

- 3. Record the following required information in the 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 Electrical 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.
- Multiple items can be included in one posting as long as the individual locations are listed in the comments. The Location box will contain the stations that encompass all the locations that are being paid for.
- If there are changes to the Schedules Sheets, enter the Conduit Run, Pull Box No., Pole No., or Cabinet Label/Name, etc., in the Location box and an explanation of the changes in the Remarks box.
- Refer to Figure 8-3 through Figure 8-11 for examples of electrical item postings with different UOM.

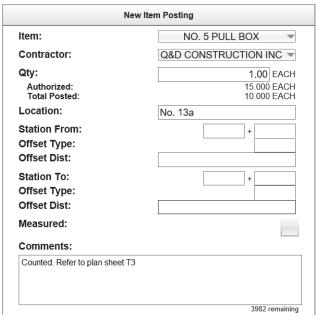


Figure 8-3: DWR Item Posting – Electrical EACH

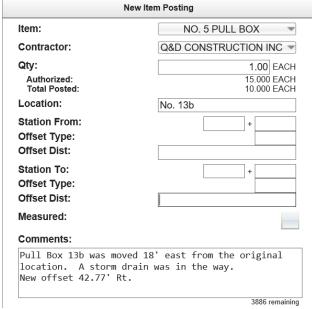


Figure 8-4: DWR Item Posting - Electrical EACH

#### NOTES for Electrical EACH (Pull Box) (Figure 8-3):

- Payment for EACH items will be based on field count.
- · Location: Enter the Pull Box number.
- Sig. Fig. = .01

NOTES for Electrical EACH (Pull Box) (Figure 8-4):

- Payment for EACH items will be based on field count.
- · Location: Enter the Pull Box number.
- Comments: Enter an explanation of the changes if there are changes to the Schedules Sheets.
- Sig. Fig. = .01

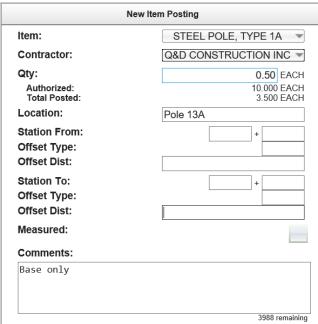


Figure 8-5: DWR Item Posting – Electrical EACH

New Item Posting						
Item:	STEEL POLE, TYPE 1A					
Contractor:	Q&D CONSTRUCTION INC					
Qty: Authorized: Total Posted:	0.50 EACH 10.000 EACH 3.500 FACH					
Location:	Pole 13A					
Station From: Offset Type: Offset Dist:	+					
Station To: Offset Type: Offset Dist:	+					
Measured:						
Comments:	_					
Pole only, Pole 13A is 100% co	mplete.					

Figure 8-6: DWR Item Posting - Electrical EACH (Pole)

3959 remaining

NOTES for Electrical EACH (Pole) (Figure 8-5):

- Payment for EACH items will be based on field count.
- Location: Enter the Pole number.
- Sig. Fig. = .01

NOTES for Electrical EACH (Pole) (Figure 8-6):

- Payment for EACH items will be based on field count.
- Pay 50% (.5) for Base and 50% (.5) for Pole.
- Location: Enter the Pole number.
- Comments: Indicate when the item is completed (base & pole is installed).
- Sig. Fig. = .01 (when complete)



Figure 8-7: DWR Item Posting – Electrical EACH (Signal Head)

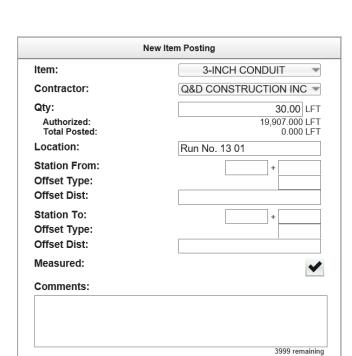


Figure 8-8: DWR Item Posting - Electrical LFT

NOTES for Electrical EACH (Signal Head) (Figure 8-7):

- Payment for EACH items will be based on field count.
- Pay 50% (.5) for Base and 50% (.5) for Pole.
- · Location: Enter the Pole number.
- Comments: Indicate when the item is completed (base & pole is installed).
- Sig. Fig. = .01 (when complete)

NOTES for Electrical LFT (Figure 8-8):

- Payment for LFT items will be based on field measurements.
- Location: Enter the Conduit Run number.
- Sig. Fig. = .01

Item:	3-INCH CONDUIT
Contractor:	Q&D CONSTRUCTION INC
Qty:	40.00 LF
Authorized: Total Posted:	19,907.000 LF 30.000 LF
Location:	Run No. 13 04
Station From:	+
Offset Type:	
Offset Dist:	
Station To:	+
Offset Type: Offset Dist:	
Measured:	
weasurea:	~
Comments:	
	3999 remaini
Attention:	3999 remaini
Attention: Attention Comments:	3999 remaini ◆

Figure 8-9: DWR Item Posting - Electrical LFT



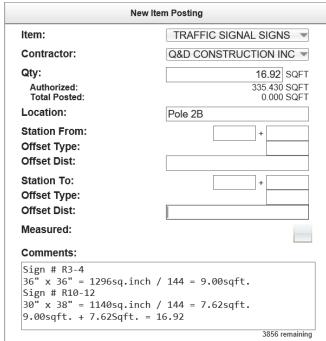
Figure 8-10: DWR Item Posting - Electrical LFT

#### NOTES for Electrical LFT (Figure 8-9):

- Payment for LFT items will be based on field measurements.
- Location: Enter the Conduit Run number.
- Comments: Enter an explanation of the changes if there are changes to the Schedules Sheets.
- Sig. Fig. = .01

NOTES for Electrical LFT (Figure 8-10):

- Payment for LFT items will be based on field measurements.
- Location: Enter the Conduit Run number.
- Comments: If there is more than one conduit/conductor per run, show the calculation for total LFT.
- Sig. Fig. = .01



NOTES for Electrical SQFT (Figure 8-11):

- Traffic signs placed on a Pole or Mast Arms are considered Electrical item that are associated with the Pole or Mast Arms.
- Multiple sign can be paid for in one posting, if it's on the same Pole or Mast Arm.
- · Location: Enter the Conduit Run number.
- Comments: Add the Sign Number and convert the Units from square inches to square feet. L x W / 144 (converting inches to feet)
- Sig. Fig. = .01

Figure 8-11: DWR Item Posting - Electrical SQFT

- 4. Record the following required information in the New Equipment window (Figure 8-12 and Figure 8-13):
  - **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.

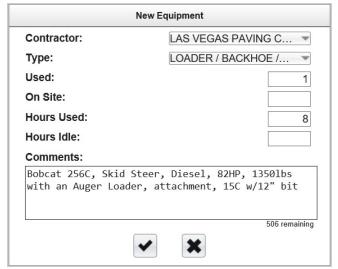


Figure 8-12: DWR Equipment Entry



Figure 8-13: DWR Equipment List

- 5. Record the following required information in the New Personnel window (Figure 8-14 and Figure 8-15):
  - 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).

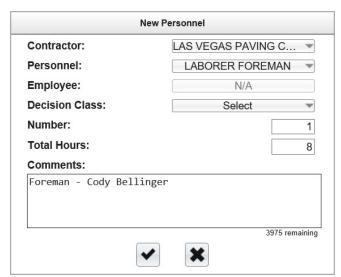


Figure 8-14: DWR Personnel Entry

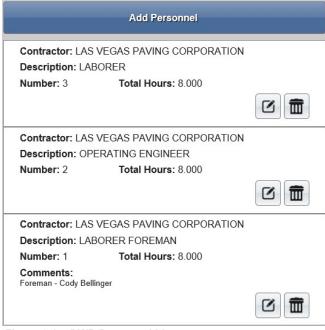


Figure 8-15: DWR Personnel List

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

**Note:** When the Sync Data process has 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 With Materials for details.

# OFFICE ENGINEER'S RESPONSIBILITIES - ELECTRICAL ITEMS

- Collect all Material Certifications. Scan and save them to the appropriate 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 and description- CERT (e.g., 03904 M6230001 Traffic Systems 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 <u>AWP Cert Sample Record Creation</u> document and Chapter 24, Progress Payments, in this Manual for details.
- Save Electrical Item photos in the appropriate Contract Files\Contract\03 Multimedia\3.# Photos directory.
- Review Electrical 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).
- Distribute executed copies of Change Orders to Inspectors.

# **ELECTRICAL ITEMS**

## 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 With Materials 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.