EARTHWORK ITEMS

This chapter contains the following sections:

OVERVIEW

Earthwork Items have different documentation requirements depending on the item. All Earthwork Items may be paid by plan or are measured and calculated. Documentation examples for a few selected Earthwork 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 that cannot be documented according to the following examples, contact the Construction Admin Services Section for assistance.

Prior to excavation operations ensure survey of surfaces are complete in the event of re-measurement and/or re-calculation requests made by the Contractor or Resident Engineer.

INSPECTOR'S RESPONSIBILITIES – EARTHWORK ITEMS

- Use the Agreement Estimate report as a reference to ensure that items and quantities are paid in the correct category (AEB).
- Use the Summary of Earthwork Quantities sheet(s), (Figure 6-1) located in the Contract plans, to help identify items, quantities, descriptions and locations. When quantity totals on the Summary of Earthwork Quantities sheet do not match quantity totals in the AEB refer to additional Structure Lists.

SUMMARY OF EARTHWORK QUANTITIES

ALL QUANTITIES MEASURED IN CUBIC YARDS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SI-050-4(008)	LANDER	3F

LOCATION CL	Station	to		Station	SIDE	ROADWAY EXCAVATION	STRUCTURE EXCAVATION	DRAINAGE EXCAVATION	SHRINK/SWELL	TOTAL EXCAVATION	EMBANKMENT	(BORROW) OR EXCESS	** TOPSOIL SALVAGE		NOTES
"P"	36+03.92	to	"P"	75+00.00	LT	29,348.44			-10.00%	26,413.60	12,910.38	13,503.22	3,843.34		Slope Flattening
"P"	36+03.92	to	"P"	75+00.00	RT	15,441.24	49.30	18.10	-10.00%	13,957.78	23,740.97	(9,783.19)	3,892.68		Slope Flattening
"P"	75+00.00	to	"P"	135+00.00	LT	12,706.47			-10.00%	11,435.82	7,364.89	4,070.93	3,657.13		Slope Flattening
"P"	75+00.00	to	"P"	135+00.00	RT	11,280.56	51.10	834.10	-10.00%	10,949.18	7,928.36	3,020.82	3,535.47		Slope Flattening
"P"	135+00.00	to	"P"	195+00.00	LT	49.98			-10.00%	44.98	3,297.37	(3,252.39)	1,857.94		Slope Flattening
"P"	135+00.00	to	"P"	195+00.00	RT	24.68	76.30	13.40	-10.00%	102.94	5,314.43	(5,211.49)	2,334.59		Slope Flattening
"P"	195+00.00	to	"P"	255+00.00	LT	15.11			-10.00%	13.60	4,374.71	(4,361.11)	2,550.10		Slope Flattening
"P"	195+00.00	to	"P"	255+00.00	RT	15.30			-10.00%	13.77	5,553.84	(5,540.07)	2,640.57		Slope Flattening
"P"	255+00.00	to	"P"	315+00.00	LT	17.03			-10.00%	15.33	8,191.45	(8,176.12)	2,959.47		Slope Flattening
"P"	255+00.00	to	"P"	315+00.00	RT	6.65			-10.00%	5.99	8,744.09	(8,738.11)	2,962.88		Slope Flattening
"P"	315+00.00	to	"P"	375+00.00	LT	1,811.54			-10.00%	1,630.39	7,702.42	(6,072.03)	3,649.00		Slope Flattening
"P"	315+00.00	to	"P"	375+00.00	RT	2,748.19	47.90	5.50	-10.00%	2,521.43	11,643.32	(9,121.89)	3,965.20		Slope Flattening
"P"	375+00.00	to	"P"	435+00.00	LT	3,335.55			-10.00%	3,002.00	1,198.30	1,803.70	3,305.81		Slope Flattening
"P"	375+00.00	to	"P"	435+00.00	RT	1,392.83	392.00	124.90	-10.00%	1,718.76	8,765.07	(7,046.31)	3,204.05		Slope Flattening
"P"	435+00.00	to	"P"	495+00.00	LT	538.05			-10.00%	484.25	5,029.26	(4,545.02)	3,092.64		Slope Flattening
"P"	435+00.00	to	"P"	495+00.00	RT	2,922.23	93.60		-10.00%	2,714.25	3,194.19	(479.94)	3,486.29		Slope Flattening
"P"	495+00.00	to	"P"	555+00.00	LT	1,559.54			-10.00%	1,403.59	5,220.20	(3,816.61)	3,330.65		Slope Flattening
"P"	495+00.00	to	"P"	555+00.00	RT	4,755.71	84.30	4.80	-10.00%	4,360.33	2,935.88	1,424.45	3,518.50		Slope Flattening
"P"	555+00.00	to	"P"	615+00.00	LT	3,196.02			-10.00%	2,876.42	2,901.57	(25.15)	3,081.59		Slope Flattening
"P"	555+00.00	to	"P"	615+00.00	RT	3,067.21			-10.00%	2,760.49	6,636.13	(3,875.64)	3,621.86		Slope Flattening
"P"	615+00.00	to	"P"	675+00.00	LT	1,485.59			-10.00%	1,337.03	4,114.24	(2,777.21)	3,124.89		Slope Flattening
"P"	615+00.00	to	"P"	675+00.00	RT	1,012.63			-10.00%	911.37	6,239.36	(5,327.99)	3,209.48		Slope Flattening
"P"	675+00.00	to	"P"	735+00.00	LT	2,364.07			-10.00%	2,127.66	7,052.63	(4,924.97)	3,409.79		Slope Flattening
"P"	675+00.00	to	"P"	735+00.00	RT	2,475.91	14.80		-10.00%	2,241.64	8,996.63	(6,754.99)	3,744.16		Slope Flattening
"P"	735+00.00	to	"P"	795+00.00	LT	2,989.57			-10.00%	2,690.61	7,564.38	(4,873.77)	3,900.18		Slope Flattening
"P"	735+00.00	to	"P"	795+00.00	RT	3,121.87	54.20		-10.00%	2,858.46	10,751.95	(7,893.49)	4,169.09		Slope Flattening
"P"	795+00.00	to	"P"	855+00.00	LT	1,687.68			-10.00%	1,518.91	8,076.52	(6,557.61)	3,499.33		Slope Flattening
"P"	795+00.00	to	"P"	855+00.00	RT	844.70	30.20		-10.00%	787.41	15,083.12	(14,295.71)	3,469.44		Slope Flattening
"P"	855+00.00	to	"P"	915+00.00	LT	210.35			-10.00%	189.32	5,595.26	(5,405.97)	2,513.41		Slope Flattening
"P"	855+00.00	to	"P"	915+00.00	RT	338.38	27.10		-10.00%	328.93	5,447.39	(5,118.46)	2,476.03		Slope Flattening
"P"	915+00.00	to	"P"	975+00.00	LT	27.40			-10.00%	24.66	13,112.30	(13,087.64)	3,359.16		Slope Flattening
"P"	915+00.00	to	"P"	975+00.00	RT	31.55	63.90		-10.00%	85.91	11,551.34	(11,465.44)	3,198.61		Slope Flattening
"P"	975+00.00	to	"P"	1035+00.00	LT	33.61			-10.00%	30.25	6,130.01	(6,099.76)	2,769.23		Slope Flattening
"P"	975+00.00	to	"P"	1035+00.00	RT	133.53	29.60		-10.00%	146.82	6,388.77	(6,241.95)	2,940.45		Slope Flattening
"P"	1035+00.00	to	"P"	1095+00.00	LT	882.48			-10.00%	794.23	7,769.10	(6,974.87)	3,186.56		Slope Flattening
"P"	1035+00.00	to	"P"	1095+00.00	RT	1,363.41	14.90		-10.00%	1,240.48	7,374.36	(6,133.88)	3,248.91		Slope Flattening
"P"	1095+00.00	to	"P"	1155+00.00	LT	6,407.88			-10.00%	5,767.09	2,351.46	3,415.63	3,518.31		Slope Flattening
"P"	1095+00.00	to	"P"	1155+00.00	RT	5,863.72	12.00	1.30	-10.00%	5,289.32	2,649.82	2,639.50	3,658.22		Slope Flattening
"P"	1155+00.00	to	"P"	1215+00.00	LT	11,172.41			-10.00%	10,055.17	43,057.83	(33,002.66)	6,130.51		Slope Flattening
"P"	1155+00.00	to	"P"	1215+00.00	RT	7,242.42	290.30	124.60	-10.00%	6,891.59	41,574.54	(34,682.95)	5,505.55		Slope Flattening
"P"	1243+20.00	to	"P"	1249+80.00	LT	590.98			-10.00%	531.88	200.26	331.62	496.23		Widening
"P"	61+99.21	to	"P"	65+08.48	LT	553.73			-10.00%	498.36	2,212.67	(1,714.31)			Reconstruct
RECONSTRUCT APPROACHES					BOTH	1,893.00			-10.00%	1,703.70		1,703.70			
Total						146,960.00	1,340.00	1,130.00		134,480.00	365,950.00	* (231,470)	136,020.00		

NOTES:

* Borrow Quantity shall be paid for with Borrow Embankment Bid Item. Excess material shall be Disposed of according to 107.14.

** Topsoil shall be salvaged to the depth specified prior to any excavation or placement of embankment.

Earthwork Quantities allow for the replacement of topsoil at specified depth to achieve final grade.

Figure 6-1: Example of a Summary of Earthwork 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 earthwork 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 6-2):
   - **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.

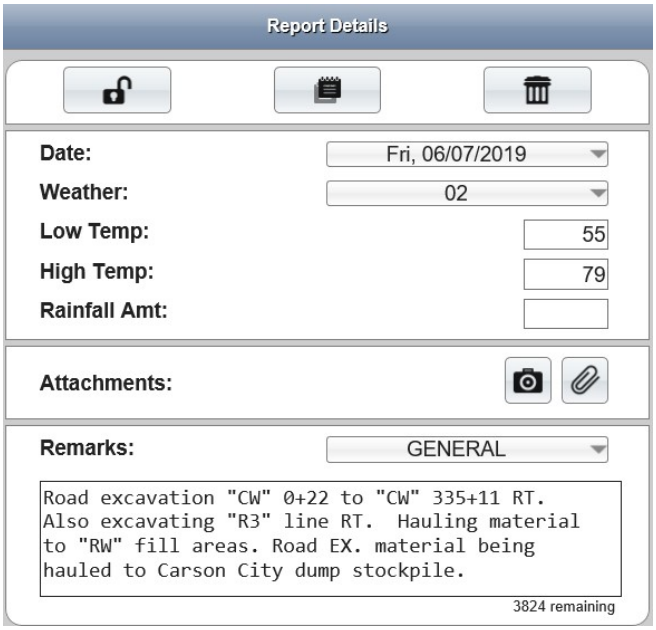


Figure 6-2: DWR Report Detail Window

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 Earthwork Item postings:

- Refer to Subsection 203.04.01, *(Excavation and Embankment) Measurement*, of the Standard Specifications for additional details/requirements on measurement for payment of excavation and embankment items.
- When excavation is utilized to construct embankment, it is only paid ONCE as an excavation item.
- The limit for payment of excavation items are based upon the Standard Plans or plan details. Changes to these limits for contractor convenience or methods of construction do not affect quantity for payment.
- The Inspector will base the quantity posted on the percent of earthwork completed for each station per the Contract plans Summary of Earthwork Quantity sheets. Indicate when a section is completed in the item posting comments.
- Refer to Figure 6-3 through Figure 6-6 for examples of Earthwork Item postings.

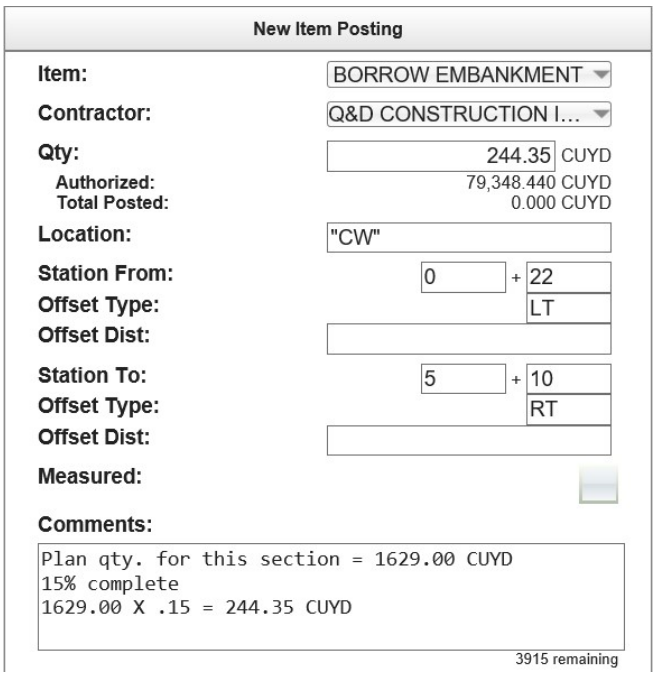


Figure 6-3: DWR Item Posting - Earthwork CUYD

NOTES for Earthwork CUYD (Figure 6-3):

- Payment for CUYD item will be based on plan quantity or field measure and calculations if different than plan.
- Calculation for CUYD if different than plan = L x W x D ÷ 27
- 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

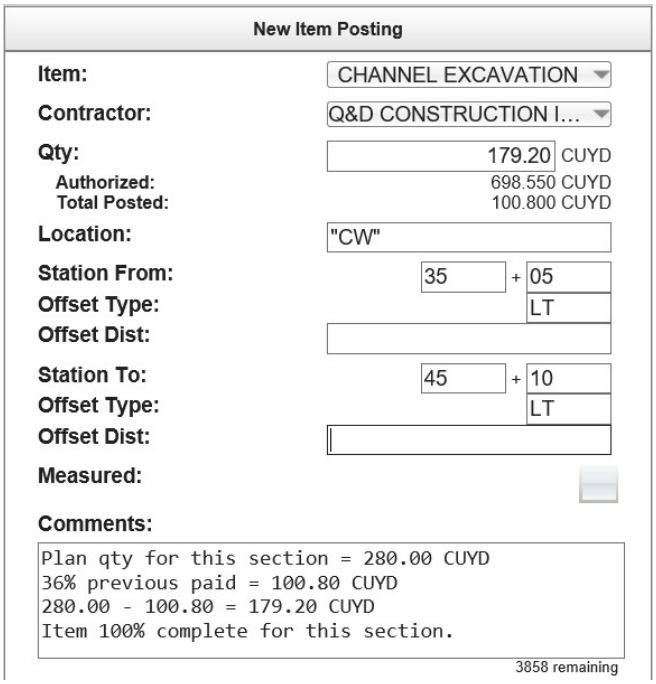


Figure 6-4: DWR Item Posting - Earthwork CUYD

NOTES for Earthwork CUYD (Figure 6-4):

- Payment for CUYD item will be based on plan quantity or field measure and calculations if different than plan.
- Calculation for CUYD if different than plan = L x W x D ÷ 27
- 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

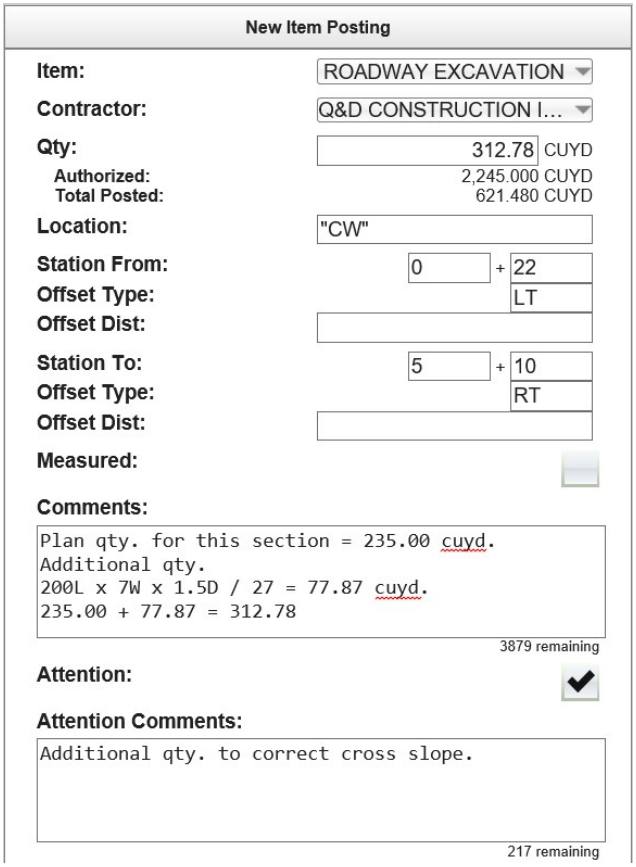
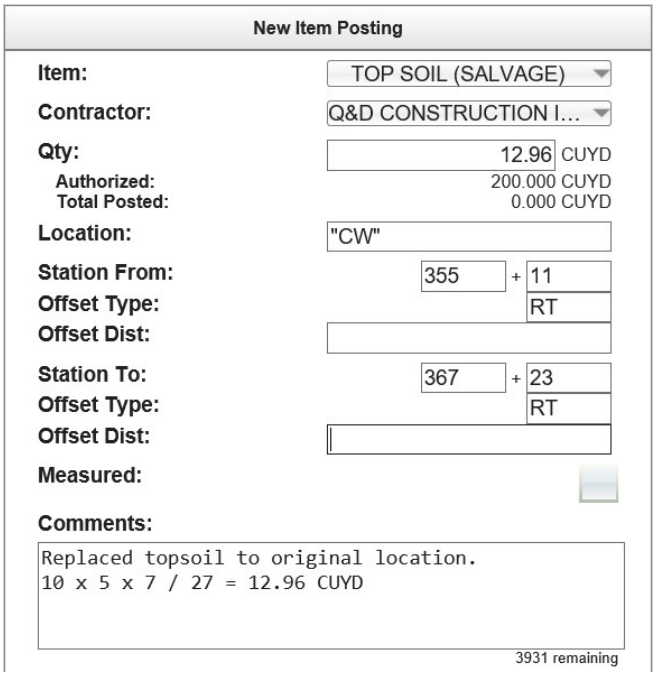


Figure 6-5: DWR Item Posting - Earthwork CUYD

NOTES for Earthwork CUYD (Figure 6-5):

- Payment for CUYD item will be based on plan quantity or field measure and calculations if different than plan.
- Calculation for CUYD if different than plan = L x W x D ÷ 27
- 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



NOTES for Earthwork CUYD (Figure 6-6):

- Payment for CUYD item will be based on plan quantity or field measure and calculations if different than plan.
- Calculation for CUYD if different than plan = L x W x D ÷ 27
- Pay .5 when item is removed and .5 when it's replaced.
- 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 6-6: DWR Item Posting - Earthwork CUYD

4. Record the following required information in the New Equipment window (Figure 6-7 and Figure 6-8):
   - **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.

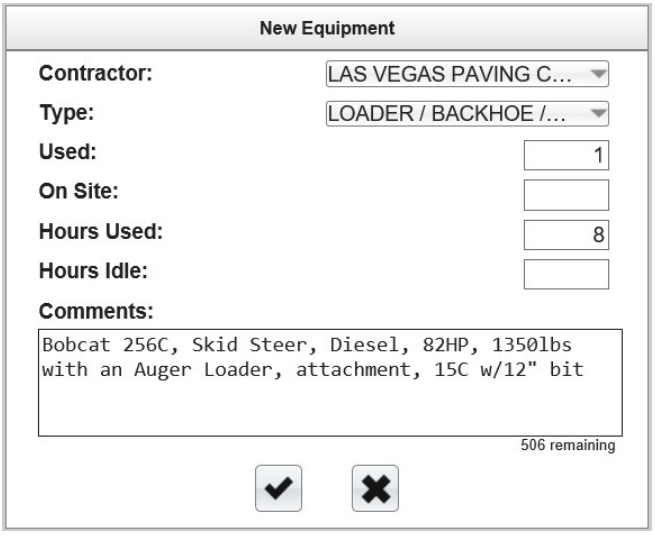


Figure 6-7: DWR Equipment Entry

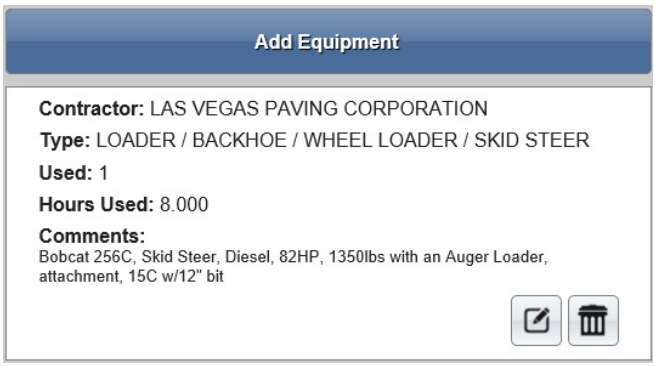


Figure 6-8: DWR Equipment List

5. Record the following required information in the New Personnel window (Figure 6-9 and Figure 6-10):
   - **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).

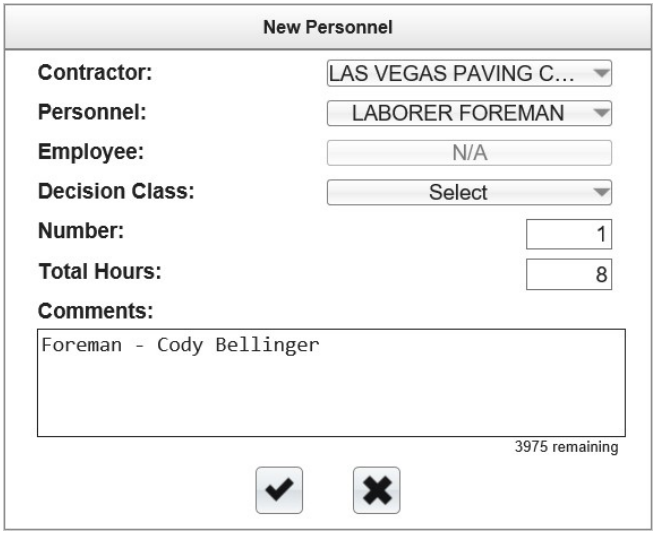


Figure 6-9: DWR Personnel Entry

Figure 6-10: 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 – EARTHWORK ITEMS

- Save Earthwork Item photos in the appropriate Contract Files\Contract\03 Multimedia\3.# Photos directory.
- Review Earthwork 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).

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.