

EARTHWORK ITEMS

This chapter contains the following sections:

Overview	6-3
Inspector's Responsibilities – Earthwork Items	6-3
Office Engineer's Responsibilities – Earthwork Items	6-8



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											STATE	PROJECT NO.	COUNTY	SHEET NO.	
											NEVADA	SI-063-4(008)	LANIER	3F	
ALL QUANTITIES MEASURED IN CUBIC YARDS															
LOCATION	SIDE	ROADWAY EXCAVATION	STRUCTURE EXCAVATION	DRAINAGE EXCAVATION	SHRINK/SWELL	TOTAL EXCAVATION	EMBANKMENT	(BORROW) OR EXCESS	** TOPSOIL SALVAGE	NOTES					
CL	Station to Station														
"P"	35+03.92 to 75+00.00	LT	28,348.24			-10.00%	26,413.90	12,910.38	13,503.22	3,843.34	Slope Flattening				
"P"	36+03.92 to 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 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 135+00.00	RT	11,260.99	51.10	834.10	-10.00%	10,949.18	7,926.36	3,020.82	3,535.47	Slope Flattening				
"P"	135+00.00 to 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 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 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 255+00.00	RT	15.30			-10.00%	13.77	5,553.94	(5,540.07)	2,640.57	Slope Flattening				
"P"	255+00.00 to 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 315+00.00	RT	6.85			-10.00%	5.99	8,744.09	(8,738.11)	2,962.88	Slope Flattening				
"P"	315+00.00 to 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 375+00.00	RT	2,748.19	47.90	5.50	-10.00%	2,521.43	11,843.32	(9,121.99)	3,965.20	Slope Flattening				
"P"	375+00.00 to 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 435+00.00	RT	1,392.83	392.00	124.90	-10.00%	1,718.76	8,785.07	(7,046.31)	3,204.05	Slope Flattening				
"P"	435+00.00 to 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 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 555+00.00	LT	1,559.54			-10.00%	1,403.59	5,220.20	(3,818.61)	3,330.65	Slope Flattening				
"P"	495+00.00 to 555+00.00	RT	4,755.71	64.30	4.80	-10.00%	4,360.33	2,935.88	1,424.45	3,518.50	Slope Flattening				
"P"	555+00.00 to 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 615+00.00	RT	3,067.21			-10.00%	2,760.49	6,636.13	(3,875.84)	3,621.86	Slope Flattening				
"P"	615+00.00 to 675+00.00	LT	1,465.59			-10.00%	1,337.03	4,114.24	(2,777.21)	3,124.89	Slope Flattening				
"P"	615+00.00 to 675+00.00	RT	1,012.63			-10.00%	911.37	6,299.36	(5,327.99)	3,209.48	Slope Flattening				
"P"	675+00.00 to 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 735+00.00	RT	2,475.91	14.80		-10.00%	2,241.64	8,996.63	(6,754.99)	3,744.18	Slope Flattening				
"P"	735+00.00 to 795+00.00	LT	2,969.57			-10.00%	2,690.61	7,564.38	(4,873.77)	3,900.18	Slope Flattening				
"P"	735+00.00 to 795+00.00	RT	3,121.97	54.20		-10.00%	2,858.46	10,751.95	(7,893.49)	4,169.08	Slope Flattening				
"P"	795+00.00 to 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 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 915+00.00	LT	210.35			-10.00%	189.32	5,595.28	(5,405.97)	2,513.41	Slope Flattening				
"P"	855+00.00 to 915+00.00	RT	338.38	27.10		-10.00%	328.93	5,447.99	(5,118.46)	2,478.03	Slope Flattening				
"P"	915+00.00 to 975+00.00	LT	27.40			-10.00%	24.68	13,112.30	(13,087.64)	3,359.18	Slope Flattening				
"P"	915+00.00 to 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 1035+00.00	LT	33.61			-10.00%	30.25	6,130.01	(6,099.76)	2,789.23	Slope Flattening				
"P"	975+00.00 to 1035+00.00	RT	133.53	29.60	1.30	-10.00%	146.62	6,388.77	(6,241.95)	2,940.45	Slope Flattening				
"P"	1035+00.00 to 1095+00.00	LT	862.49			-10.00%	794.23	7,789.10	(6,974.87)	3,198.56	Slope Flattening				
"P"	1035+00.00 to 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 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 1155+00.00	RT	5,863.72	12.00		-10.00%	5,289.32	2,849.82	2,639.50	3,658.22	Slope Flattening				
"P"	1155+00.00 to 1215+00.00	LT	11,172.41			-10.00%	10,655.17	43,057.83	(33,002.66)	6,130.51	Slope Flattening				
"P"	1155+00.00 to 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 1249+80.00	LT	590.98			-10.00%	531.88	200.26	331.62	496.23	Widening				
"P"	81+89.21 to 85+08.48	BOTH	553.73			-10.00%	498.36	2,212.67	(1,714.31)		Reconstruct				
"P"	RECONSTRUCT APPROACHES	BOTH	1,893.00			-10.00%	1,703.70		1,703.70						
Total			146,990.00	1,340.00	1,130.00		134,480.00	385,950.00	(231,470)	136,020.00					

Figure 6-1: Example of a Summary of Earthwork Quantities Sheet

- Review the following for accuracy:
 - Special Provisions
 - Supplemental Notices
 - Contract Modifications

Note: When any changes are made to an item, reference the Contract Modification number in the IDR item posting remarks.

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

INSPECTOR DAILY REPORT (IDR) – MOBILE INSPECTOR

1. Create an IDR 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 and hours
 - Personnel – title and hours
2. Record the following required information in the Report Details window (Figure 6-2):
 - Date
 - Weather
 - Low and high temperature
 - Attachments (N/A) – Send ALL photos via email
 - Remarks – Verify with the Resident Engineer on what information is required.

Figure 6-2: IDR Report Detail Window

3. Record the following required information in the New Item Postings window:
 - Item
 - Proj/Catg – Refer to the AEB report.
 - Contractor – ALWAYS the Prime Contractor (Subs are not allowed).
 - Qty – Based on plan, measurements and calculations
 - Location – Must show line designation, LT, RT or CL and offset if known.
 - Station From/To – Refer to Contract plans.
 - Attention Flag – Use to bring attention to Resident Engineer and Office Engineer for overruns and plan errors.
 - Remarks – 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.

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.
- Refer to Figure 6-3 through Figure 6-6 for examples of Earthwork Item postings.

New Item Posting

Item: ROADWAY EXCAVATION

Proj/Catg: 60458C2C, 15, CONSTR...

Contractor: FISHER SAND & GRAVEL CO

Qty: 312.78 CUYD

Location: "S" LT to RT

Station From: 0 + 22.00

Station To: 5 + 10.00

Attention Flag:

Remarks:
Plan qty. for this section = 235.00 cuyd.
Additional qty to correct cross slope.
 $200 \times 7 \times 1.5 / 27 = 77.78$ cuyd.

137 remaining

Figure 6-3: IDR 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 = $L \times W \times D \div 27$
- In Location, enter the Line Designation and LT, RT, or CL.
- Sig. Fig. = .01

New Item Posting

Item: BORROW EMBANKMENT

Proj/Catg: 60638C2C, 10, Construct...

Contractor: LAS VEGAS PAVING CORP...

Qty: 244.35 CUYD

Location: "S" LT to RT

Station From: 0 + 22.00

Station To: 5 + 10.00

Attention Flag:

Remarks:
Plan qty. for this section = 1629.00 CUYD
15% complete
 $1629.00 \times .15 = 244.35$ CUYD

180 remaining

Figure 6-4: IDR 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 = $L \times W \times D \div 27$
- In Location, enter the Line Designation and LT, RT, or CL.
- Sig. Fig. = .01

New Item Posting

Item: CHANNEL EXCAVATION

Proj/Catg: 60638C2C, 08, Landscape & ...

Contractor: LAS VEGAS PAVING CORP...

Qty: 179.20 CUYD

Location: "X" 33+79 LT

Station From: [] + []

Station To: [] + []

Attention Flag: []

Remarks:
Plan qty for this section = 280.00 CUYD
36% previous paid = 100.80 CUYD
280.00 - 100.80 = 179.20 CUYD
Item 100% complete

147 remaining

Figure 6-5: IDR 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 = $L \times W \times D \div 27$
- In Location, enter the Line Designation and LT, RT, or CL.
- Sig. Fig. = .01

New Item Posting

Item: TOP SOIL (SALVAGE)

Proj/Catg: 60638C2C, 08, Landscape & ...

Contractor: LAS VEGAS PAVING CORP...

Qty: 12.96 CUYD

Location: "LNE" RT

Station From: 355 + 11

Station To: 367 + 23

Attention Flag: []

Remarks:
Replaced topsoil to original location.
 $10 \times 5 \times 7 \div 27 = 12.96$ CUYD

192 remaining

Figure 6-6: IDR Item Posting - Earthwork CUYD

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 = $L \times W \times D \div 27$
- Pay .5 when item is removed and .5 when it's replaced.
- In Location, enter the Line Designation and LT, RT, or CL.
- Sig. Fig. = .01

- Record the following required information in the New Equipment window (Figure 6-7 and Figure 6-8):
 - Contractor – Actual contractor performing the work (including subcontractors)
 - Type – Detailed description of the equipment (e.g., diesel, HP, model, make)
 - Number – How many of each type
 - Hours – Total hours in use

Note: An attachment to an equipment's base configuration must have its own record.

New Equipment

Contractor: LAS VEGAS PAVI...
 Type: Bobcat 256C Skid ...
 Number: 1
 Hours: 8

Figure 6-7: IDR Equipment Entry

Add Equipment

LAS VEGAS PAVING CORPORATION
 Bobcat 256C Skid Steer, Diesel, 82HP, 2350lbs
 Number: 1.00 Hours: 8.00

LAS VEGAS PAVING CORPORATION
 Bobcat Auger Loader, Attachment, 15C w/12" bit
 Number: 1.00 Hours: 8.00

Figure 6-8: IDR Equipment List

5. Record the following required information in the New Personnel window (Figure 2-9 and Figure 2-10):
 - Contractor – Actual contractor performing the work (including subcontractors)
 - Type – Details of personnel type (e.g., foreman, laborer, truck driver)
 - Number – How many of each title
 - Hours – Total hours worked

New Personnel

Contractor: LAS VEGAS PAVING CO...
 Type: Foreman - Donald Driver
 Number: 1
 Hours: 8

Figure 6-9: IDR Personnel Entry

Add Personnel	
LAS VEGAS PAVING CORPORATION Foreman - Donald Driver Number: 1.00 Hours: 8.00	 
LAS VEGAS PAVING CORPORATION Laborer Number: 3.00 Hours: 8.00	 
LAS VEGAS PAVING CORPORATION Operator Number: 2.00 Hours: 8.00	 

Figure 6-10: IDR Personnel List

6. Complete a final review of the IDR and lock it.

Note: When a Mobile Inspector IDR is completed and locked the information is uploaded into a FieldManager IDR, where it is reviewed and generated for processing progress payments.

OFFICE ENGINEER'S RESPONSIBILITIES – EARTHWORK ITEMS

- Save Earthwork Item photos in the appropriate EDOC Contract Files\Contract Files\ Division No. 3 - Multimedia Records\3.# Photographs with Descriptions directory.
- Review Earthwork Item calculation sheets for accuracy and save electronically in the appropriate EDOC Contract Files\Contract Files\Division No. 7 - Construction Pay Estimate and Related Data\7.# IDR Calculation Sheets directory using this naming convention: IDR YYYY-MM-DD Inspectors Initials, (e.g. IDR 2016-03-19 KMM).

INSPECTOR DAILY REPORT (IDR) – FIELDMANAGER

When a Mobile Inspector IDR is locked by an Inspector, the information is uploaded into a FieldManager IDR. Refer to Chapter 7, Inspector Daily Report, in the [FieldManager User Guide](#) for details.

1. Verify the following:
 - Information in the Comments and Remarks
 - Information in the Contractor tab (Personnel and Equipment)
 - That all items are paid correctly according to the contract documents (e.g., plans, supplemental notices, Contract Modifications).
 - Item quantities
 - Quantities in postings are documented to the correct Significant Figure
 - Stations and Line Designations in the Locations
 - Calculations are correct.
 - Check that the Inspector's IDRs 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.

2. Generate the IDR.

