

LIQUID AND EMULSIFIED ASPHALT ITEMS

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OVERVIEW

All Liquid and Emulsified Asphalt Items have a unit of measure (UOM) of tons or square yards. All Liquid and Emulsified Asphalt Items must be measured. Documentation examples for a few selected Liquid and Emulsified Asphalt 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.

Theoretical application rates are NO LONGER permitted to be used to determine the total tons placed for payment of all Liquid and Emulsified Asphalt items.

Forms change periodically, go to the SharePoint [Construction Forms](#) area for the latest form available.

LIQUID ASPHALTS

Liquid Asphalts are typically used for prime coats and curing seals. These items are typically paid for by the square yard.

- Liquid asphalts are also referred to as cut-back asphalts and include MC-70, MC-250, etc.
- Liquid asphalts will be documented in the Record of Delivery—Liquid Asphalt and the Liquid/Emulsified Asphalt Application and Payment spreadsheets.
- When another material has been approved for use in lieu of the liquid asphalt, there may be different application rates and dilution factors that must be documented. Make sure to check the contract's Special Provisions and/or the manufacturer's recommendation to assure proper application.
- Use the Agreement Estimate report as a reference to ensure that items and quantities are paid in the correct category (AEB).
- Information on Liquid Items are found on the Summary of Quantities sheets in the Contract plans.
- There are 3 ways to document the application of Liquid Asphalt:
 - Total delivery (Bill of Lading)
 - Weigh Back - Weighing the trucks over the Contractor's scales
 - Gallon Meter - List the following in the Remarks box of the posting tab in the Inspector's IDR.
 - Beginning meter reading
 - Ending meter reading
 - Actual gallons used after applying the Temperature Volume Correction factor
- In no case will the Liquid Asphalt pay quantity exceed the total certified asphalt delivered less any material wasted or left in storage.

EMULSIFIED ASPHALTS

Emulsified Asphalts are typically used for tack coats, seal coats, chips seals and cold in place recycle. These items can be paid for by square yard, tons or they may be incidental to other items of work.

- Emulsified asphalts (CMS-2S, SS-1h, LMCRS-2H, etc.) will be documented in the Record of Delivery—Liquid Asphalt and the Liquid/Emulsified Asphalt Application and Payment spreadsheets.
- It is the Inspector's responsibility to ensure proper dilution and application rates regardless of the item's UOM.
- Emulsified asphalt is delivered either diluted or undiluted.
 - If the emulsified asphalt is delivered diluted, verify the proper dilution ratios are on the bill of lading.
 - If the emulsified asphalt is delivered undiluted, use the Oil and Water Check Sheet to verify the correct gallons of water were added.

Note: The Liquid/Emulsified Asphalt Oil and Water Check Sheet is designed to assist the inspector in determining the correct pounds/tons of water added to the oil to get the approved oil/water ratio. Refer to the Liquid/Emulsified Asphalt Oil and Water Check Sheet in the Fourth tab of the Liquid/Emulsified Asphalt Application and Payment spreadsheet (Figure 11-7).

- Once proper dilution is obtained for the specified application, measurement for payment and application rate can proceed.
- There are 3 ways to document the application of Emulsified Asphalt:
 - Total delivery (Bill of Lading)
 - Weigh Back - Weighing the trucks over the Contractor's scales
 - Gallon Meter - List the following in the Remarks box of the posting tab in the Inspector's IDR.
 - Beginning meter reading
 - Ending meter reading
 - Actual gallons used after applying the Temperature Volume Correction factor
- In no case will the emulsified asphalt pay quantity exceed the total certified asphalt delivered less any material wasted or left in storage.

INSPECTOR'S RESPONSIBILITIES – LIQUID/EMULSIFIED ASPHALTS

- Review the following for accuracy:
 - Special Provisions
 - Supplemental Notices
 - Contract Modifications
- Collect a Bill of Lading (B/L) (Figure 11-20) for each delivery of liquid/emulsified asphalt.
 - Record the Contract ID in the upper right-hand corner.
 - Check and initial all weight calculations.
 - Turn into the Office Engineer each day.

Note: Each B/L for emulsified asphalts must show the weight of raw asphalt separately from the water added or show the mix percent. If the emulsified asphalt is delivered without this information on the B/L, the Resident Engineer shall inform the contractor that it is unacceptable, and any application shall be done without payment. The B/L must plainly state whether the material was delivered diluted or undiluted. The Inspector is responsible for documenting (on the B/L) the weight of raw asphalt separately from the water added.

- Collect a Material Certification (Figure 11-21) for each delivery of Liquid and Emulsified asphalt.
 - Record the Contract ID in the upper right-hand corner.
 - Turn into the Office Engineer each day.

Note: The Transmittal for Asphalt Samples (Form No. 020-016) will be filled out by the inspector, attached to the liquid or emulsified asphalt sample, and sent into the Materials Division. If there are any questions concerning this form or this process, contact the Materials Division.

- It is the Inspector's responsibility to ensure proper dilution and application rates regardless of the item's UOM or payment.

RECORD OF DELIVERY—LIQUID/EMULSIFIED ASPHALT SPREADSHEETS

The Record of Delivery – Liquid Asphalt and Emulsified Asphalt (Diluted/Undiluted) spreadsheets (Figure 11-1 through Figure 11-3) are used to track the asphalt delivered to the job site. Separate spreadsheets will be provided for liquid asphalts and emulsified

asphalts (dilute)/(undiluted). The spreadsheets are used as part of the source documents for payment.

1. Open the Record of Delivery—Liquid/Emulsified Asphalt spreadsheet(s) received in an email from the Office Engineer. Refer to the [How to Manage Load Sheets](#) document located on SharePoint under Construction Administrative Services Documents, Manuals and Guides, EDOC for details on maintaining the spreadsheet.
2. Record the following information from the Bill of lading (B/L) into the appropriate spreadsheet:
 - Inspector’s initials
 - Date delivered (which may not be the same date the load was applied)
 - Truck No.
 - Trailer No. (if applicable)
 - Bill of Lading No.
 - Tons delivered
 - Any remarks that are needed
3. Save the spreadsheet(s) and email to the Office Engineer.

Record of Delivery -- Liquid Asphalt

Contract No.: Total Tons:

Item No.:

Description:

Plan Quantity: tons

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	Bill of Lading No.	Tons Delivered	Cumulative Tons	Remarks
TMH	02/21/2017	182025		46401	3.39	3.39	
TMH	02/22/2017	182025		47521	3.05	6.44	

Sheet1

Figure 11-1: Record of Delivery – Liquid Asphalt

Record of Delivery -- Emulsified Asphalt, Undiluted

Contract No.: Total Tons:

Item No.:

Description:

Plan Quantity: tons

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered (Raw)	Cumulative Tons (Raw)	Remarks
TMH	03/12/2017	56781	635	5594	10.57	10.57	Delivered and stored in Contractors yard
							Item will be mixed to 60/40 by contractor

Undiluted Diluted

Figure 11-2: Record of Delivery – Emulsified Asphalt, Diluted

Record of Delivery -- Emulsified Asphalt, Undiluted

Contract No.: 3583 Total Tons: 21.15

Item No.: 405 0120

Description: SS-1H Raw

Plan Quantity: 500.00 tons

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered (Raw)	Cumulative Tons (Raw)	Remarks
TMH	03/08/2017	182021		55933	1.27	1.27	
TMH	03/08/2017	182023		55942	4.20	5.47	
TMH	03/09/2017	182024		55944	3.39	8.86	
TMH	03/10/2017	182027		55949	5.00	13.86	
TMH	03/13/2017	182029		55949	7.29	21.15	

Undiluted Diluted

Figure 11-3: Record of Delivery – Emulsified Asphalt, Undiluted

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT SPREADSHEET

The Liquid/Emulsified Asphalt Application and Payment spreadsheet (Figure 11-4 through Figure 11-6) is used to track asphalt applications, payments and oil/water ratios. Each liquid/emulsified asphalt bid item will be documented on a separate spreadsheet. The spreadsheet is used as part of the source documents for payment.

- Open the Liquid/Emulsified Asphalt Application and Payment spreadsheet received in an email from the Office Engineer.
- Record the following
 - Contract Number
 - Item (Description)
 - Item Number
 - CATG#: Only ONE category (AEB) per sheet
 - Dilution % Factor: Enter as whole number (60/40 mix enter as 60)
 - Temperature Volume Correction: If required, refer to the Temperature Volume Corrections for Emulsified Asphalt section in this chapter for the correction factor. (MUST be entered to 0.00001. DEFAULT = 1.00000)
 - Bill of Lading #
 - Bill of Lading Tons Delivered (Raw): If item is delivered diluted, enter tonnage on ticket and place 100 in Dilution % Factor
 - Insp: Inspector initials
 - Date
 - Oil Temp: from the truck.
 - Station to Station: Complete station to station, including line designation and LT, RT, or CL.
 - Length: Actual length measured in feet, NOT 'Station to Station'.
 - Width: Actual Width measured in feet, NOT 'Varies Width'.
 - For Total SQYD, Gallons, and App Rate:
 - Enter Length/Width for each location. The spreadsheet will fill in the SQYD column. If you have more than one line, manually add up the total and place in TOTAL SQYD column. Once the Total SQYD has been calculated and entered into the spreadsheet, the spreadsheet will automatically calculate the Application Rate. Determine total gallons used and fill in the column. Use the (lb/gal) conversion table found in Subsection 109.01, (*Measurement and Payment*) *Measurement of Quantities*, in the Standard Specifications or manufacture specifications entered to 0.01.
- Save the spreadsheet and email to the Office Engineer.

Note: Pay will be based on delivery minus waste and/or material left in storage, not based on the application rate. In no case will the liquid asphalt pay quantity exceed the certified total asphalt delivered, less any wasted material and less any

material left in storage. Temperature Conversion Factor is only applicable when using the gallon meter to determine total tons placed.

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT											
Cont:	3583	Item:	MC-70	Item Number:	4060100	CATG #:	3	ONE CATEGORY PER SHEET			
Total BOL Tons Delivered (Raw):			3.39	Total SQYD used:			4500.0	To convert gallons to tons use formulas: Gal x Temp Corr = Actual Gal. Actl Gal / (Gal/ton) = Actl tons. (Gal/ton) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons			
Total BOL Tons Delivered (Diluted):			3.39	Total Gallons used:			858				
Total Tons Placed (Diluted):			3.39	Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // Undiluted = 100% Factor. For specialized items, refer to manufacture specifications for dilution % factor							
Total Tons Remaining (Diluted):			0.00	Dilution % Factor:			100				
Bill of Lading #:		46401		Bill of Lading Tons Delivered (Raw):			3.39	PMT #:			
Insp:	Date:	Temp. Vol. Correction	Oil Temp	Station to Station:	Length (feet):	Width (feet):	SQYD:	TOTAL SQYD	Tonnage Used:	Gallons:	App. Rate:
TMH	2/28/2017		145	"X" 740+32 to "X" 741+32 Lt.	100.0	5.0	55.6				
				"X" 741+32 to "X" 745+32 Lt.	400.0	9.0	400.0				
				"X" 878+20 to "X" 902+80 Lt.	2800.0	13.0	4044.4	4500.0	3.39	858	0.19
							0.0				
CAT # 01		CAT # 02		CAT #03		Oil & Water Check Sheet					

Figure 11-4: Liquid / Emulsified Asphalt Application and Payment Sheet (Liquid Asphalt)

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT											
Cont:	3583	Item:	SS-1H (Diluted)	Item Number:	4060180	CATG #:	2	ONE CATEGORY PER SHEET			
Total BOL Tons Delivered (Raw):			4.00	Total SQYD used:			17374.7	To convert gallons to tons use formulas: Gal x Temp Corr = Actual Gal. Actl Gal / (Gal/ton) = Actl tons. (Gal/ton) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons			
Total BOL Tons Delivered (Diluted):			4.00	Total Gallons used:			1217				
Total Tons Placed (Diluted):			3.80	Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // Undiluted = 100% Factor. For specialized items, refer to manufacture specifications for dilution % factor							
Total Tons Remaining (Diluted):			0.20	Dilution % Factor:			100				
Bill of Lading #:		5269		Bill of Lading Tons Delivered (Raw):			4.00	PMT #:			
Insp:	Date:	Temp. Vol. Correction	Oil Temp	Station to Station:	Length (feet):	Width (feet):	SQYD:	TOTAL SQYD	Tonnage Used:	Gallons:	App. Rate:
TMH	3/20/2017		130	"L" 110+13 to "L" 240+44 Rt	13031.0	12.0	17374.7	17374.7	3.80	1217	0.07
							0.0				
							0.0				
							0.0				
CAT # 01		CAT # 02		CAT # xxx		Oil & Water Check Sheet					

Figure 11-5: Liquid / Emulsified Asphalt Application and Payment Sheet (Emulsified Asphalt Diluted)

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT													
Cont:	3583		Item:	SS-1H (Undiluted)		Item Number:	4050120		CATG #:	2		ONE CATEGORY PER SHEET	
Total BOL Tons Delivered (Raw):			4.20		Total SQYD used:			10120.0		To convert gallons to tons use formulas: Gal x Temp Corr = Actual Gal. Actl Gal / (Gal/ton) = Actl tons. (Gal/ton) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons			
Total BOL Tons Delivered (Diluted):			6.00		Total Gallons used:			607					
Total Tons Placed (Diluted):			2.52		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60% (raw) to 40% (diluted) = 60% Factor // 70% (raw) to 30% (diluted) = 70% Factor // Undiluted = 100% Factor. For specialized items, refer to manufacture specifications for dilution % factor								
Total Tons Remaining (Diluted):			3.48										
Temperature Volume Correction for Emulsified Asphalts (see Pg 11-18, Figure 11-22 in Documentation Manual). Must enter correction factor and oil temperature each time that the oil temp changes.													
						Dilution % Factor:		70		109.01 Standard Plans (lb/gal) conversion factor: 8.3			
Bill of Lading #:		55942		Bill of Lading Tons Delivered (Raw):				4.20		PMT #:			
Insp:	Date:	Temp. Vol. Correction	Oil Temp	Station to Station:	Length (feet):	Width (feet):	SQYD:	TOTAL SQYD	Tonnage Used:	Gallons:	App. Rate:		
TMH	3/8/2017		130	"L" 5+09 to "L" 16+84 Lt	1175.0	48.0	6266.7						
				"L" 19+80 to "L" 48+70 Lt	2890.0	12.0	3853.3	10120.0	2.52	607	0.06		
							0.0						
							0.0						
CAT # 01		CAT # 02		CAT # xxx		Oil & Water Check Sheet							

Figure 11-6: Liquid / Emulsified Asphalt Application and Payment Sheet (Emulsified Asphalt Undiluted)

NOTES for Emulsified Asphalt item postings only:

- If the total tonnage placed was based off reading the gallon meter, the Inspector must document the beginning meter reading, ending meter reading, gallons used, and the temperature correction factor used, in the Remarks box of the posting tab in the IDR. Refer to the Temperature Volume Corrections for Emulsified Asphalt section in this chapter.
- Gallons Used X Multiplier (M) = Gallons Used (Corrected)
- Example: If the oil is being stored in the truck at 60 degrees, the multiplier is 1.00000 X recorded gallons = corrected gallons. The Inspector needs to convert the temperature corrected gallons to tons by utilizing the following calculation: Gallon Meter to Tons = (Gallons / (Gal/ton)). Refer to Subsection 109.01, (Measurement and Payment) Measurement of Quantities, in the Standard Specifications.
- If the truck sprays completely out, the total tons delivered listed on the Bill of Lading (B/L) must also be documented in the 'Tonnage' box to show that the total delivered was the total placed.
- If a weighback is needed and provided, the quantity placed in the Tonnage column is the DIFFERENCE between the Tons Delivered on the Bill of Lading (B/L) and the tons on the weighback ticket. This number is the actual tonnage that was placed. The Tonnage total will automatically appear in the Tonnage Placed box, which must match the tonnage posted for payment in the Office Engineer's IDR. The Tons Remaining box is the DIFFERENCE between the tons delivered and the tonnage placed. If that number is negative, it will display in Red, and either another B/L is required for payment or the calculation needs to be checked again.
- If the entire truck was not sprayed out and the contractor does not provide a weighback ticket, or a working gallon meter reading, Liquidated Damages will be assessed per Subsection 109.2, (Measurement and Payment) Scope of Payment, in the Special Provisions.
- It is the Inspector's responsibility to verify that the application rate falls within an acceptable range according to the Standard Specifications.

OIL AND WATER CHECK SHEET

When the emulsified asphalt is delivered raw and placed in a tank, obtain a tare weight on the distributor truck before the asphalt and water is added. When the asphalt is added the truck will be weighed and then weighed again when the water is added. The ratio of oil to water will vary depending on the specification and the type of material. Make sure to check the Special Provisions to assure the correct ratio is being used. When the truck is finished spraying for the day the truck will be weighed once again to determine what was placed for the day, as shown below. Use the Oil and Water Check Sheet to verify dilution rates are correct (Figure 11-7).

Note: Make sure that any water ratio calculations are documented on the Bill of Lading sheets.

Note: Check the Manufacturer's Recommendation for the specific material and the Special Provisions for the contract to assure the correct oil/water ratio is being applied.

- Record the following:
 - Contract No.
 - Item (Description):
 - Item No.
 - Ticket No.
 - Truck No.
 - Gross weight in pounds: (Oil and Water)
 - Tare weight in pounds (Oil)
 - Dilution % Factor
- Save the spreadsheet and email it to the Office Engineer.

Liquid/Emulsified Asphalt Oil & Water Check Sheet						
Cont:	3583	Item:	SS-1H (diluted)	Item Number:	4060180	
Actual Field Measured Product (entered in pounds)						
Ticket #:	Truck #:	Gross Weight In pounds:	Tare Weight in pounds:	Net Weight in pounds:	Net Weight in tons:	Item:
5594	56781	33640	12500	21140	10.57	Oil
Enter Pounds in this order:						
1) Tare Weight of Oil		47733	33640	14093	7.05	Water
2) Gross Weight of Oil						
3) Gross Weight of Water	Mixed Oil & Water Total in Tons:				17.62	
Theoretical Field Product by Dilution Factor %						
Enter Dilution % Factor as whole number (ex: 60/40 dilution factor would be entered as 60):					60	
Raw Tons of Oil:	10.57	Total tons of Oil & Water:	17.62			
Tons of Water:	7.05	Pounds of Water that must added to Oil for a				
		60 % Diluted mixture:	14093			
Actual Field Measured Product vs Theoretical Field Product by Dilution Factor % Comparison						
Total pounds of Water used in Actual Field Measured Product (in pounds):					14093	
Total pounds of Water used in Theoretical Field Product by % Diluted Factor:					14093	
Difference in pounds between Actual Field Measured and Theoretical Field Product:					0	
CAT # x CAT # xx CAT # xxx Oil & Water Check Sheet (+)						

Figure 11-7: Liquid / Emulsified Asphalt Oil & Water Check Sheet

INSPECTOR DAILY REPORT (IDR) – MOBILE INSPECTOR (LIQUID/EMULSIFIED ASPHALTS)

- 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 – N/A Liquid/Emulsified Asphalt Ton Items. The item posting will be completed by the Office Engineer in FieldManager.
 - Equipment – Type and hours
 - Personnel – Title and hours
2. Record the following required information in the Report Details window (Figure 11-8):
- 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.

Report Details

Date: Tue, 02/28/2017
Weather: Cool and clear
Low Temp: 56 °F
High Temp: 67 °F

Attachments:

Remarks:
 MC-70 - Sprayed out the entire truck, covering a total of 4604.45 sqyd.
 App rate = (3.39x253)/4604.45 = 0.19
 Plant ran well for the entire 10 hour shift. Spoke with the contractor regarding the plans for tomorrow's paving. They will start at 5:30am at "X" 740+32 Rt.

31730 remaining

Figure 11-8: IDR Liquid Asphalt Report Detail Window

Report Details

Date: Fri, 03/10/2017
Weather: Warm and clear
Low Temp: 60 °F
High Temp: 83 °F

Attachments:

Remarks:
 Paving operations starting at 6:00am at "L" 5+09 Lt. Ended at "L" 48+70 Lt at 6:00 pm. Sprayed SS-1H over a total of 10,120.00 sqyd. Received a weighback ticket showing a total of 2.52 tons placed. (2.52 x 241)/10120 = .06 app rate for the day.

31757 remaining

Figure 11-9: IDR Emulsified Asphalt (Diluted) Detail Window

3. Record the following required information in the New Equipment window (Figure 11-10 and Figure 11-11):
- Contractor – Actual contractor performing the work (include subs).
 - 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 11-10: 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 11-11: IDR Equipment List

4. Record the following required information in the New Personnel window (Figure 11-12 and Figure 11-13):
 - Contractor – Actual contractor performing the work (include subs).
 - 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 11-12: 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 11-13: IDR Personnel List

- 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 – LIQUID/EMUSIFIED ASPHALTS

- Collect all Material Certifications. Scan and save them to the appropriate EDOC Contract Files\Material and Testing Files\Division No. 4 – Materials Division Certs and Test Reports\4.# Send original certifications to the Materials Division for approval.
- Save liquid and emulsified asphalt item photos in the appropriate EDOC Contract Files\Contract Files\Division No. 3 - Multimedia Records\3.# Photographs with Descriptions directory.
- Review liquid and emulsified asphalt 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 Calc Sheets directory using this naming convention: IDR YYYY-MM-DD Inspectors Initials, (e.g. IDR 2016-03-19 KMM).
- Approve materials in FieldManager when the approved material certifications are received from the Materials Division. Refer to Chapter 6, Working with Materials, in the [FieldManager User Guide](#), for details.
- Distribute executed copies of Contract Modifications to Inspectors.

Important: If SS-1h is delivered diluted to the jobsite and the Bill of Lading (B/L) does not show weight of raw asphalt separately from the water added or the state mix percent, the Resident Engineer will inform the Contractor that it is unacceptable, and any application will be done without payment. The Inspector is responsible for documenting (on the B/L) the weight of raw asphalt separately from the water added.

Important: If the entire truck was not sprayed out and the contractor does not provide a weigh back ticket, or a working gallon meter reading, Liquidated Damages will be assessed per Subsection 109.2, (Measurement and Payment) Scope of Payment, in the Special Provisions.

RECORD OF DELIVERY—LIQUID/EMULSIFIED ASPHALT SPREADSHEET

The Record of Delivery – Liquid Asphalt and Emulsified Asphalt (Diluted/Undiluted) spreadsheets (Figure 11-1 through Figure 11-3) are used to track the asphalt delivered to the job site. Separate spreadsheets will be provided for liquid asphalts and emulsified asphalts dilute/undiluted. The spreadsheets are used as part of the source documents for payment.

1. Email the appropriate Record of Delivery—Liquid/Emulsified Asphalt spreadsheet to the Inspector daily. Refer to the [How to Manage Load Sheets](#) document located on SharePoint under Construction Administrative Services Documents, Manuals and Guides, EDOC for details on maintaining the spreadsheet.
2. Verify the following:
 - Each B/L has a contract number that corresponds to the spreadsheet.
 - The weight calculations have been checked and initialed.
 - There are enough B/Ls to cover what has been applied.
3. Save the completed the spreadsheet(s) (Figure 11-14) to the appropriate EDOC Contract Files\Contract Files\Division No. 8 - Daily Record of Scale Weights\8.# directory.

Record of Delivery -- Emulsified Asphalt, Diluted							
Contract No.:	3583			Total Tons:	9.90		
Item No.:	406 0180						
Description:	SS-1H diluted						
Plan Quantity:	2,500.00 tons						
Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered	Cumulative Tons	Remarks
TMH	03/20/2017	25614	047	5269	4.00	4.00	
TMH	03/21/2017	25614	047	5300	3.58	7.58	
TMH	03/22/2017	40652	625	5590	2.32	9.90	
<div style="display: flex; justify-content: space-between; align-items: center;"> Undiluted Diluted </div>							

Figure 11-14: Record of Delivery – Emulsified Asphalt, Diluted

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT SPREADSHEET

The Liquid/Emulsified Asphalt Application and Payment spreadsheet (Figure 11-15 through Figure 11-17) is used to track asphalt applications, payments and oil/water ratios. Each Liquid/Emulsified Asphalt bid item will be documented on a separate spreadsheet. The spreadsheet is used as part of the source documents for payment.

1. Email the Liquid/Emulsified Asphalt Application and Payment spreadsheet to the Inspector daily.
2. Verify the following:
 - Calculations are correct
 - All stationing has a line designation and LT, RT, or CL.
 - The application rate is within tolerance.
 - There are enough Bill of Ladings (B/L) to cover the tonnage of material being paid.
3. Add the Payment Number.
4. Save the completed the spreadsheet(s) to the appropriate EDOC Contract Files\Contract Files\Division No. 8 - Daily Record of Scale Weights\8.# directory.

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT											
Cont:	3583	Item:	MC-70	Item Number:	4060100	CATG #:	3	ONE CATEGORY PER SHEET			
Total BOL Tons Delivered (Raw):		3.39		Total SQYD used:		4500.0		To convert gallons to tons use formulas: Gal x Temp Corr = Actual Gal. Actl Gal / (Gal/ton) = Actl tons. (Gal/ton) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons			
Total BOL Tons Delivered (Diluted):		3.39		Total Gallons used:		858					
Total Tons Placed (Diluted):		3.39		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // Undiluted = 100% Factor. For specialized items, refer to manufacture specifications for dilution % factor							
Total Tons Remaining (Diluted):		0.00									
Temperature Volume Correction for Emulsified Asphalts (see Pg 11-18, Figure 11-22 in Documentation Manual). Must enter correction factor and oil temperature each time that the oil temp changes.				Dilution % Factor:		100		109.01 Standard Plans (lb/gal) conversion factor: 8.3			
Bill of Lading #:		46401		Bill of Lading Tons Delivered (Raw):		3.39		PMT #:		1	
Insp:	Date:	Temp. Vol. Correction	Oil Temp	Station to Station:	Length (feet):	Width (feet):	SQYD:	TOTAL SQYD	Tonnage Used:	Gallons:	App. Rate:
TMH	2/28/2017		145	"X" 740+32 to "X" 741+32 Lt.	100.0	5.0	55.6				
				"X" 741+32 to "X" 745+32 Lt.	400.0	9.0	400.0				
				"X" 878+20 to "X" 902+80 Lt.	2800.0	13.0	4044.4	4500.0	3.39	858	0.19
							0.0				
CAT # 01 CAT # 02 CAT # 03 Oil & Water Check Sheet (+)											

Figure 11-15: Liquid / Emulsified Asphalt Application and Payment Sheet (Liquid Asphalt)

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT											
Cont:	3583	Item:	SS-1H (Diluted)	Item Number:	4060180	CATG #:	2	ONE CATEGORY PER SHEET			
Total BOL Tons Delivered (Raw):		4.00		Total SQYD used:		17374.7		To convert gallons to tons use formulas: Gal x Temp Corr = Actual Gal. Actl Gal / (Gal/ton) = Actl tons. (Gal/ton) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons			
Total BOL Tons Delivered (Diluted):		4.00		Total Gallons used:		1217					
Total Tons Placed (Diluted):		3.80		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // Undiluted = 100% Factor. For specialized items, refer to manufacture specifications for dilution % factor							
Total Tons Remaining (Diluted):		0.20									
Temperature Volume Correction for Emulsified Asphalts (see Pg 11-18, Figure 11-22 in Documentation Manual). Must enter correction factor and oil temperature each time that the oil temp changes.				Dilution % Factor:		100		109.01 Standard Plans (lb/gal) conversion factor: 8.3			
Bill of Lading #:		5269		Bill of Lading Tons Delivered (Raw):		4.00		PMT #:		2	
Insp:	Date:	Temp. Vol. Correction	Oil Temp	Station to Station:	Length (feet):	Width (feet):	SQYD:	TOTAL SQYD	Tonnage Used:	Gallons:	App. Rate:
TMH	3/20/2017		130	"L" 110+13 to "L" 240+44 Rt	13031.0	12.0	17374.7	17374.7	3.80	1217	0.07
							0.0				
							0.0				
							0.0				
CAT # 01 CAT # 02 CAT # xxx Oil & Water Check Sheet (+)											

Figure 11-16: Liquid / Emulsified Asphalt Application and Payment Sheet (Emulsified Asphalt Diluted)

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT											
Cont:	3583	Item:	SS-1H (Undiluted)	Item Number:	4050120	CATG #:	2	ONE CATEGORY PER SHEET			
Total BOL Tons Delivered (Raw):		4.20		Total SQYD used:		10120.0		To convert gallons to tons use formulas: Gal x Temp Corr = Actual Gal. Actl Gal / (Gal/ton) = Actl tons. (Gal/ton) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons			
Total BOL Tons Delivered (Diluted):		6.00		Total Gallons used:		607					
Total Tons Placed (Diluted):		2.52		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // Undiluted = 100% Factor. For specialized items, refer to manufacture specifications for dilution % factor							
Total Tons Remaining (Diluted):		3.48									
Temperature Volume Correction for Emulsified Asphalts (see Pg 11-18, Figure 11-22 in Documentation Manual). Must enter correction factor and oil temperature each time that the oil temp changes.				Dilution % Factor:		70		109.01 Standard Plans (lb/gal) conversion factor: 8.3			
Bill of Lading #:		55942		Bill of Lading Tons Delivered (Raw):		4.20		PMT #:		3	
Insp:	Date:	Temp. Vol. Correction	Oil Temp	Station to Station:	Length (feet):	Width (feet):	SQYD:	TOTAL SQYD	Tonnage Used:	Gallons:	App. Rate:
TMH	3/8/2017		130	"L" 5+09 to "L" 16+84 Lt	1175.0	48.0	6266.7				
				"L" 19+80 to "L" 48+70 Lt	2890.0	12.0	3853.3	10120.0	2.52	607	0.06
							0.0				
							0.0				
CAT # 01 CAT # 02 CAT # xxx Oil & Water Check Sheet (+)											

Figure 11-17: Liquid / Emulsified Asphalt Application and Payment Sheet (Emulsified Asphalt Undiluted)

INSPECTOR DAILY REPORT (IDR) – FIELDMANAGER (LIQUID/EMULSIFIED ASPHALTS)

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.

INSPECTOR'S IDR

1. Verify the following:
 - Information in the General tab Comments
 - Information in the Contractor tab (Personnel and Equipment)
2. Generate the IDR.

ITEM POSTING IDR

1. Create an IDR in FieldManager to document the item postings for the liquid/emulsified asphalt ton items:
 - In the General Tab enter a Comment related to the item posting.
 - Enter an Item Posting (Figure 11-18 and Figure 11-19) for the Liquid/Emulsified Asphalt ton item based on the Liquid/Emulsified Asphalt Application and Payment spreadsheet.

Note: These IDRs can be completed daily, weekly or bi-weekly within the two-week pay period.

NOTES for Liquid Asphalt TON (Figure 11-18):

- In Location, enter the Line Designation and LT, RT, or CL.
- In Remarks, reference the Liquid/Emulsified Asphalt Application and Payment spreadsheet.
- Sig. Fig. = .01

Figure 11-18: Office Engineer's IDR Item Posting (Liquid Asphalt TON Item)

Change IDR (IDR: 4/19/2017, Trish M Hodgson, 1) (Contract: 03583)

General Contractors Site Times Postings Attachments View

Item: 4060180, EMULSIFIED ASPHALT, TYPE SS-1H (DILUTED)
 Prop. Ln: 1350 Unit: TON Catg. Auth. Qty: 500.000 Catg. Auth. Amt: \$500.00
 Type: EXTRA WORK Unit Price: \$1.000 Catg. Qty. Placed: 5.040
 Catg. Pending Chgs: 0.000 Catg. Qty. Paid: 0.000

Item Posting

Project: 60638C2C MAIN ROADWAY BREAKOUT
 Category: 02 New "WS" Bridge I-3035 "WS"34+30.85 TO "WS" 58+00.
 Contractor: LAS VEGAS PAVING CORPORATION
 Quantity: 2.520 TON Attention:
 Station From: 5+09 Breakdown:
 Station To: 48+70
 Location: X Lt
 Remarks: Paying based off of weighback (inspector's report 3/10/17 TMH). For details see Liquid/Emulsified Asphalt Record of Application and Payment Spreadsheet in division 8.

Materials OK Delete Cancel Add Materials Add Breakdowns

Figure 11-19: Office Engineer's IDR Item Posting (Emulsified Asphalt TON Item)

NOTES for Emulsified Asphalt TON (Figure 11-19):

- In Location, enter the Line Designation and LT, RT, or CL.
- In Remarks, reference the Liquid/Emulsified Asphalt Application and Payment spreadsheet.
- Sig. Fig. = .01

2. Generate the IDR.

BILL OF LADING AND CERTIFICATION FOR LIQUID AND EMULSIFIED ASPHALTS

- Collect all Bill of Ladings (B/Ls) (Figure 11-20), Water Tickets (Figure 11-21) or Weighback Tickets from the Inspectors. Scan and save them to the appropriate EDOC Contract Files\Contract Files\Division No. 8 – Daily Record of Scale Weights\8.# BL directory.
- Collect all Material Certifications (Figure 11-21). Scan and save them to the appropriate EDOC Contract Files\Material and Testing Files\Division No. 4 – Materials Division Certs and Test Reports\4.# directory. Send original certifications to the Materials Division for approval.
- Complete the Transmittal for Test Samples and Certifications (Form No. 020-018) and send to the Materials Division. If there are any questions concerning this form, contact the Materials Division.

STRAIGHT BILL OF LADING

Load #4
3583
11-12-16
JG

SHIPPER/ORIGIN:
ERGON ASPHALT AND EMULSIONS, INC.
3901 WEST PONDEROSA WAY
LAS VEGAS, NV 89118
702-736-2059

Emergency Response Telephone Number:
Call CHEMTREC (1-800-424-9300)
Ergon, Inc. Contract Number 7986

BOL NUMBER: 21080

SOLD TO: LAS VEGAS PAVING CORPORATION 4420 SOUTH DECATUR BLVD LAS VEGAS NV 89103	CUSTOMER NO.: 464300 PO NUMBER: REFERENCE (JOB) NUMBER: 88AP PROJECT NUMBER: PROJECT NAME: General ORIGINAL BOL:
CONSIGNEE/DESTINATION: 2013476 LAS VEGAS PAVING CORPORATION-E CLARK COUNTY, NV	SHIP DATE: 11/10/2016 PRGHT: COL TIME IN/OUT: 12:30/12:40 CARRIER: LAS VEGAS PAVING TRUCK-TRLR NO.: 182025 ORDER #: AGRMNT #:

PRODUCT	TANK	TEMP	UCM NET VOLUME	WEIGHTS	
CSS-1H	2	180.00 F	UG6 747.642	GROSS:	41,180 LBS 18,679 KG
		65.61 C	LTR 2,630.133	TARE:	39,840 LBS 15,803 KG
				NET:	6,340 LBS 2,876 KG
				NET:	3.170 TON 2.876 MT
Lbs/gal @ 60F: 8.480		Kilograms per Liter: 1.018		Spec Gravity @ 60F: 1.017	

Loaded By: _____ Additive: N/A
 LAB/LOT NUMBER: _____ Certification #: _____
 PROPER SHIPPING DESCRIPTION: Non-Regulated, Asphalt Product

Certification: Ergon Asphalt & Emulsions certifies that the materials provided under this bill of lading shall meet the standards of and were tested in accord with Ergon's Quality Control Plan submitted to the state and thereby conforms to the State of Nevada's specifications. Ergon Asphalt & Emulsions tests in accordance with AASHTO/ASTM testing procedures or reasonable equivalents. The densities and Specific Gravity denoted are typical results. Product densities can vary through the processes of manufacturing, shipping, and handling.

6340 / 8780 = 72% oil
 2440 / 8780 = 28% WTR

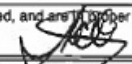
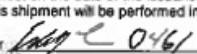
This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Signature by Shipper: 
Cargo Tank Supplied By Carrier/Carrier Compliance to Laws - Where the cargo tank is supplied by the carrier, the carrier hereby certifies that the cargo tank supplied for this shipment is a proper container for the transportation of this commodity. This is to acknowledge that the carrier has in his possession or has been offered and accepted the required hazard materials placards and/or emergency response information. This property described herein in apparent good order is received by the carrier shown on this Bill of Lading and the carrier agrees to transport the property to the consignee and the destination set forth herein subject to the classifications and tariffs, and the terms and conditions of the Uniform Domestic Straight Bill of Lading found in National Motor Freight Classification, in effect on the date of the issuance of this Bill of Lading or the applicable contract with shipper. It is further agreed by the carrier that the transportation of this shipment will be performed in compliance with all applicable rules, regulations and laws. Signature by Motor Carrier: 

Figure 11-20: Bill of Lading

ERGON ASPHALT & EMULSIONS, INC.

Loading Checklist	Weights
<p style="text-align: center;"><i>Driver to complete this section</i></p> <p>Customer Name <u>LVP</u></p> <p>Product to be loaded <u>Water</u></p> <p>Last product loaded _____</p> <p>Is the product requested for loading compatible with the last product hauled? Yes ___ No ___</p> <p>Is the trailer free and clear of contaminants? Yes ___ No ___</p> <p>Is the trailer free of water? Yes ___ No ___</p> <p>Driver Signature <u>[Signature]</u></p>	<p>ID# 02 WEIGHT 411801b 12:41 11-10-16</p> <p>CUSTOMER NAME STREET ADDRESS CITY STATE ZIP ID# 02 12:48 11-10-16</p> <p>GROSS 436201b TARE 411801b NET 24401b Gals: <u>292.96</u> <u>294.00 Gals</u></p>
<p style="text-align: center;"><i>Operator to complete this section</i></p> <p>Bill of Lading# <u>21080</u></p> <p>Operator Signature _____</p>	

6370/8780

Figure 11-21: Bill of Lading Water Ticket

3583



Ergon Asphalt & Emulsions, Inc.

Certificate of Analysis

Date 11/3/2016
Product CSS-1H
State Nevada
Facility Location LAS VEGAS, NV (T2)

This material conforms to RTC specifications for CSS-1h in accordance with NDOT Section 703 Table 4 of Standard Specifications for Road and Bridge Construction.

TEST	MIN	MAX	RESULT
Saybolt Viscosity, 25°C, SSF	20	100	36
Residue by Distillation, 260°C, 15 min hold	57	---	63
Storage Stability, 24 Hr, %	---	1	0.1
Sieve Test, %	---	0.1	0.05
Cement Mixing Test, %	---	2.0	0
Particle Charge Test	PASS	---	PASS
Penetration, 25°C, 100g, 5 sec, dmm	40	90	70
Solubility, %	97.5	---	99.9
Ductility, 25°C, HG, 5cm/min, cm	40	---	80



 Quality Assurance Manager Date
 11/3/2016

Figure 11-22: Material Certification

TEMPERATURE VOLUME CORRECTIONS FOR EMULSIFIED ASPHALT

TABLE C1 TEMPERATURE VOLUME CORRECTIONS FOR EMULSIFIED ASPHALT

LEGEND: t = Observed Temperature in Degrees Celsius (Fahrenheit)
 M = Multiplier for Correcting Volumes to the Basis of 15.6°C (60°F)

*Multiplier (M) for °C is a close approximation.

°C ^t	°F	M*	°C ^t	°F	M*	°C ^t	°F	M*
10.0	50	1.00250	35.0	95	0.99125	60.0	140	0.98000
10.6	51	1.00225	35.6	96	0.99100	60.6	141	0.97975
11.1	52	1.00200	36.1	97	0.99075	61.1	142	0.97950
11.7	53	1.00175	36.7	98	0.99050	61.7	143	0.97925
12.2	54	1.00150	37.2	99	0.99025	62.2	144	0.97900
12.8	55	1.00125	37.8	100	0.99000	62.8	145	0.97875
13.3	56	1.00100	38.3	101	0.98975	63.3	146	0.97850
13.9	57	1.00075	38.9	102	0.98950	63.9	147	0.97825
14.4	58	1.00050	39.4	103	0.98925	64.4	148	0.97800
15.0	59	1.00025	40.0	104	0.98900	65.0	149	0.97775
15.6	60	1.00000	40.6	105	0.98875	65.6	150	0.97750
16.1	61	0.99975	41.1	106	0.98850	66.1	151	0.97725
16.7	62	0.99950	41.7	107	0.98825	66.7	152	0.97700
17.2	63	0.99925	42.2	108	0.98800	67.2	153	0.97675
17.8	64	0.99900	42.8	109	0.98775	67.8	154	0.97650
18.3	65	0.99875	43.3	110	0.98750	68.3	155	0.97625
18.9	66	0.99850	43.9	111	0.98725	68.9	156	0.97600
19.4	67	0.99825	44.4	112	0.98700	69.4	157	0.97575
20.0	68	0.99800	45.0	113	0.98675	70.0	158	0.97550
20.6	69	0.99775	45.6	114	0.98650	70.6	159	0.97525
21.1	70	0.99750	46.1	115	0.98625	71.1	160	0.97500
21.7	71	0.99725	46.7	116	0.98600	71.7	161	0.97475
22.2	72	0.99700	47.2	117	0.98575	72.2	162	0.97450
22.8	73	0.99675	47.8	118	0.98550	72.8	163	0.97425
23.3	74	0.99650	48.3	119	0.98525	73.3	164	0.97400
23.9	75	0.99625	48.9	120	0.98500	73.9	165	0.97375
24.4	76	0.99600	49.4	121	0.98475	74.4	166	0.97350
25.0	77	0.99575	50.0	122	0.98450	75.0	167	0.97325
25.6	78	0.99550	50.6	123	0.98425	75.6	168	0.97300
26.1	79	0.99525	51.1	124	0.98400	76.1	169	0.97275
26.7	80	0.99500	51.7	125	0.98375	76.7	170	0.97250
27.2	81	0.99475	52.2	126	0.98350	77.2	171	0.97225
27.8	82	0.99450	52.8	127	0.98325	77.8	172	0.97200
28.3	83	0.99425	53.3	128	0.98300	78.3	173	0.97175
28.9	84	0.99400	53.9	129	0.98275	78.9	174	0.97150
29.4	85	0.99375	54.4	130	0.98250	79.4	175	0.97125
30.0	86	0.99350	55.0	131	0.98225	80.0	176	0.97100
30.6	87	0.99325	55.6	132	0.98200	80.6	177	0.97075
31.1	88	0.99300	56.1	133	0.98175	81.1	178	0.97050
31.7	89	0.99275	56.7	134	0.98150	81.7	179	0.97025
32.2	90	0.99250	57.2	135	0.98125	82.2	180	0.97000
32.8	91	0.99225	57.8	136	0.98100	82.8	181	0.96975
33.3	92	0.99200	58.3	137	0.98075	83.3	182	0.96950
33.9	93	0.99175	58.9	138	0.98050	83.9	183	0.96925
34.4	94	0.99150	59.4	139	0.98025	84.4	184	0.96900
						85.0	185	0.96875

Figure 11-23: Temperature Volume Corrections for Emulsified Asphalt Chart