

LIQUID AND EMULSIFIED ASPHALT ITEMS

This chapter contains the following sections:

Overview	11-3
Inspector’s Responsibilities – Liquid/Emulsified Asphalt Items Office	11-4
Engineer’s Responsibilities – Liquid/Emulsified Asphalt Items	11-13

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 DWR.
 - Beginning meter reading
 - Ending meter reading
 - Gallons used

Note: *NDOT is no longer applying a 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 DWR.
 - Beginning meter reading
 - Ending meter reading
 - Gallons used

Note: NDOT is no longer applying a 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 ASPHALT ITEMS

- Review the following for accuracy:
 - Special Provisions
 - Supplemental Notices
 - Change Orders
- 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 11-22) for each delivery of Liquid and Emulsified asphalt.
 - Record the Contract ID in the upper right-hand corner if you receive a paper copy.
 - 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.

- Open the Liquid/ Emulsified Asphalt Application and Payment spreadsheet 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.
- Select the appropriate Record of Delivery tab at the bottom of the spreadsheet and record the following:
 - 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
- Save the spreadsheet(s) and email to the Office Engineer.

Record of Delivery -- Liquid Asphalt

Contract No.:	3583	Total Tons:	9.83
Item No.:	4060100		
Description:	MC-70		
Plan Quantity:	325.00 tons		

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered	Cumulative Tons	Remarks
TMH	06/07/2020	182025		46401	3.39	3.39	
TMH	07/08/2020	182025		47521	6.44	9.83	

Rec of Delv Liquid Asphalt | Rec of Del Emulsified Undiluted | Rec of Delv Emulsified Diluted | Prime Coat | Tack Coat | Seal Coat | Oil & Water Check Sheet

Figure 11-1: Record of Delivery – Liquid Asphalt

Record of Delivery -- Emulsified Asphalt, Diluted

Contract No.:	3583	Total Tons:	10.57
Item No.:	4060180		
Description:	SS-1H (Diluted)		
Plan Quantity:	48.00 tons		

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered	Cumulative Tons	Remarks
TMH	03/18/2020	56781	635	5594	10.57	10.57	Delivered and stored in contractors yard Item will be mixed to 60/40 by contractor

Rec of Delv Liquid Asphalt | Rec of Del Emulsified Undiluted | Rec of Delv Emulsified Diluted | Prime Coat | Tack Coat | Seal Coat | Oil & Water Check Sheet

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

Record of Delivery -- Emulsified Asphalt, Undiluted

Contract No.:	3583	Total Tons:	21.15
Item No.:	4050120		
Description:	SS-1H (Raw)		
Plan Quantity:	40.00 tons		

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered (Raw)	Cumulative Tons (Raw)	Remarks
TMH	03/10/2020	182021		55933	7.29	7.29	
TMH	03/16/2020	182023		55942	5.00	12.29	
TMH	03/16/2020	182024		55944	3.39	15.68	
TMH	03/20/2020	282027		55949	4.20	19.88	
TMH	03/21/2020	182029		55949	1.27	21.15	

Rec of Delv Liquid Asphalt	Rec of Del Emulsified Undiluted	Rec of Delv Emulsified Diluted	Prime Coat	Tack Coat	Seal Coat	Oil & Water Check Sheet
----------------------------	--	--------------------------------	------------	-----------	-----------	-------------------------

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.

1. Open the Liquid/Emulsified Asphalt Application and Payment spreadsheet received in an email from the Office Engineer.
2. Select the appropriate tab at the bottom of the spreadsheet: Prime Coat, tack Coat, or Seal Coat.
3. Record the following
 - Contract Number
 - Item (Description)
 - Item Number
 - Dilution % Factor: Enter as whole number (60/40 mix enter as 60)
 - Bill of Lading Tons Delivered per day: If item is delivered diluted, enter tonnage per day and place 100 in Dilution % Factor
 - Insp: Inspector initials
 - Date
 - 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 and Gallons (Using the digital meter from the truck; take the beginning read minus the ending read for the gallons placed). If using the Bill of Lading tons or the Weighback tons, the calculation is provided on the Liquid/Emulsified Asphalt and Payment spreadsheet to determine.
 - Once the gallons are determine and entered, the computer will calculate the Tons and the App. Rate column. When entering the gallons per stationing, the App. Rate is calculated for that station only. When there are multiple stations but are only documenting the total gallons placed for the day on the last line, the spreadsheet will calculate the App. Rate for that last station only however, it will total the the SQYDs, Gallons, Tons and App. Rate for the entire day at the bottom of the page.
 - If at any time the "Total Tons Remaining (Diluted)" number is red, there were not enough Bill of Ladings (B/L) collected to cover the material places. Obtain more B/L.
 - REMARKS: Add the Category/AEB of where the material is to be paid in. If paid in more than one Category (ies)/AEB(s) break out how much are paid in each. If the item is incidental, document how much was incidental. If paid by the SQYD, add the total SQYD per day to show how much SQYD will be paid on the estimate.
4. 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.

LIQUID/EMULSIFIED ASPHALT APPLICATION AND PAYMENT									
Cont:	3583	Item:	MC-70	Item Number:	4060100				
Total BOL Tons Delivered (Raw):		3.39		Total SQYD used:		4500.0			
Total BOL Tons Delivered (Diluted):		3.39		Total Gallons used:		790.0			
Total Tons Placed (Diluted):		3.28		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // 33% (raw) 66% (diluted) = 33% Factor // 25% (raw) 75% (diluted) = 25% Factor. Undiluted or Delivered Diluted = 100% Factor				To convert gallons to tons use formulas: (Gal x (lb/gal)) ÷ 2000 = tons. (lb/gal) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons	
Total Tons Remaining (Diluted):		0.11		Dilution % Factor:		100		109.01 Standard Plans (lb/gal) conversion factor: 8.3	
<small>In "Remarks" box, document total tons paid per category per estimate, and indicate if item was incidental to a plantmix bid item. If payment is calculated off weighback tickets or the bill of lading, use the tons to gallons formula to calculate gallons to enter into the "Gallons" column to calculate application rate.</small>									
Bill of Lading Tons Delivered (Per Day):						3.39		PMT #:	
Insp:	Date:	Station to Station:	Length (feet):	Width (feet):	SQYD:	Gallons:	Tons:	App. Rate:	Remarks:
TMH	6/7/2020	"X" 740+32 to "X" 741+32 LT.	100.0	5.0	55.56	10.00	0.04	0.18	
		"X" 741+32 to "X" 745+32 LT.	400.0	9.0	400.00	20.00	0.08	0.05	Cat. # 01 = 0.12
		"X" 878+20 to "X" 902+80 RT	2800.0	13.0	4,044.44	760.00	3.15	0.19	Cat. # 03 = 3.15
Totals:					4,500.00	790.00	3.28	0.18	
<small>Record of Delv Liquid Asphalt Record of Del Emulsified Undiluted Record of Delv Emulsified Diluted Prime Coat Tack Coat Seal Coat Oil & Water Check Sheet</small>									

Calculated Application Rate per locations.
Total calculated Application Rate per day.

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				
Total BOL Tons Delivered (Raw):		4.00		Total SQYD used:		17374.7			
Total BOL Tons Delivered (Diluted):		4.00		Total Gallons used:		950.0			
Total Tons Placed (Diluted):		3.94		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // 33% (raw) 66% (diluted) = 33% Factor // 25% (raw) 75% (diluted) = 25% Factor. Undiluted Material or Delivered Diluted = 100% Factor				To convert gallons to tons use formulas: (Gal x (lb/gal)) ÷ 2000 = tons. (lb/gal) conversions found in Standard Specs Section 109.01 pg. 67 tables For tons to gallons use formula: (tons x 2000)/8.3 = Gallons	
Total Tons Remaining (Diluted):		0.06		Dilution % Factor:		100		109.01 Standard Plans (lb/gal) conversion factor: 8.3	
<small>In "Remarks" box, document total tons paid per category per estimate, and indicate if item was incidental to a plantmix bid item. If payment is calculated off weighback tickets or the bill of lading, use the tons to gallons formula to calculate gallons to enter into the "Gallons" column to calculate application rate.</small>									
Bill of Lading Tons Delivered (Per Day):						4.00		PMT #:	
Insp:	Date:	Station to Station:	Length (feet):	Width (feet):	SQYD:	Gallons:	Tons:	App. Rate:	Remarks:
IDK	3/20/2017	"L" 110+13 to "L" 240+44 Rt.	13031.0	12.0	17374.67	950.00	3.94	0.05	Paying 3.94 tons in CAT #1
Totals:					17374.67	950.00	3.94	0.05	
<small>Record of Delivery Diluted Prime Coat Tack Coat Seal Coat Oil & Water Check Sheet</small>									

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				
Total BOL Tons Delivered (Raw):		4.20		Total SQYD used:		10120.0		To convert gallons to tons use formulas: (Gal x (lb/gal)) + 2000 = tons. (lbs/gal) conversions found in Standard Specs Section 109.01 pg. 67 tables	
Total BOL Tons Delivered (Diluted):		4.20		Total Gallons used:		600.0		For tons to gallons use formula: (tons x 2000)/8.3 = Gallons	
Total Tons Placed (Diluted):		2.49		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // 33% (raw) 66% (diluted) = 33% Factor // 25% (raw) 75% (diluted) = 25% Factor. Undiluted or Delivered Diluted = 100% Factor					
Total Tons Remaining (Diluted):		1.71		Dilution % Factor:		100		109.01 Standard Plans (lb/gal) conversion factor: 8.3	
In "Remarks" box, document total tons paid per category per estimate, and indicate if item was incidental to a plantmix bid item. If payment is calculated off weighback tickets or the bill of lading, use the tons to gallons formula to calculate gallons to enter into the "Gallons" column to calculate application rate.									
Bill of Lading Tons Delivered (Per Day):						4.20		PMT #:	
Insp:	Date:	Station to Station:	Length (feet):	Width (feet):	SQYD:	Gallons:	Tons:	App. Rate:	Remarks:
TMH	3/20/2020	"L" 5+09 to "L" 16+84 LT.	1175.0	48.0	6,266.67	400.00	1.66	0.06	Catg. # 1 = 1.66
		"S" 19+80 to "S" 48+70 LT	2890.0	12.0	3,853.33	200.00	0.83	0.05	Catg. # 2 = .83
Totals:					10,120.00	600.00	2.49	0.06	
Rec of Delv Liquid Asphalt Rec of Del Emulsified Undiluted Rec of Delv Emulsified Diluted Prime Coat Tack Coat Seal Coat 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 and ending meter reading and the gallons used in the Remarks box of the posting tab in the DWR.
- If the truck sprays completely out, the total tons delivered listed on the Bill of Lading (B/L) must be converted to gallons by applying the formula listed in the top right corner of the spreadsheet. The total gallons must then be documented in the "Gallons" field and the computer will automatically fill in the Tons field.
- If a weighback is needed and provided, then the total tons placed according to the weighback must be converted into gallons and documented in the "Gallons" field.
- 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.

1. 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
2. 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

DAILY WORK REPORT (DWR) – MOBILE INSPECTOR (LIQUID/EMULSIFIED ASPHALTS)

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 – N/A for Plantmix Ton Items. The item posting will be completed by the Office Engineer in AWP.
 - Equipment – type, number and hours used
 - Personnel – title and hours
2. Record the following required information in the Report Details window (Figures 11-8 and 11-9):
 - 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 11-8: DWR Liquid Asphalt (Undiluted) Report Detail Window

Figure 11-9: DWR 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: Select from the Equipment list
 - Used: How many of each type.
 - Hours Used: Total hours in use.
 - Comments: Details of the type of equipment (e.g., diesel, HP, model, make). Include equipment attachment information if applicable.

New Equipment

Contractor: LAS VEGAS PAVING C... ▾

Type: LOADER / BACKHOE / ... ▾

Used: 1

On Site:

Hours Used: 8

Hours Idle:

Comments:

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

506 remaining

✓
✗

Figure 11-10: DWR Equipment Entry

Add Equipment

Contractor: LAS VEGAS PAVING CORPORATION

Type: LOADER / BACKHOE / WHEEL LOADER / SKID STEER

Used: 1

Hours Used: 8.000

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

✎
🗑

Figure 11-11: DWR 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: Select from the Personnel list.
 - Number: How many of each title.
 - Total Hours: Total hours worked.
 - Comments: Details of personnel type (e.g., foreman w/name, laborer, truck driver).

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

Figure 11-12: DWR Personnel Entry

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

Figure 11-13: DWR Personnel List

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

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

DAILY WORK REPORT (DWR) – AWP EDITS

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

OFFICE ENGINEER'S RESPONSIBILITIES – LIQUID/EMULSIFIED ASPHALT ITEMS

- 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.
 - Name the scanned file with the Item No. and Description (e.g., 4060100 Liquid Asphalt, Type MC-70.pdf).
 - Email the scanned certifications to the Materials Division for approval.
- Withhold item payment(s) for insufficient material certifications using AWP's User-Generated Quantity-Based Item Adjustments. Refer to Chapter 9, Payment Estimates, in the [AWP User Guide](#) and Chapter 24, Progress Payments, in this Manual for details.
- 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.# DWR Calc Sheets directory using this naming convention: DWR YYYY-MM-DD Inspectors Initials, (e.g. DWR 2016-03-19 KMM).
- Approve materials in AWP when the approved material certifications are received from the Materials Division. Refer to Chapter 6, Working with Materials, in the [AWP User Guide](#), for details.
- Distribute executed copies of Change Orders 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:	10.57
Item No.:	4060180		
Description:	SS-1H (Diluted)		
Plan Quantity:	48.00 tons		

Inspector (Initials)	Date (mm/dd/yyyy)	Truck No.	Trailer No.	B/L No.	Tons Delivered	Cumulative Tons	Remarks
TMH	03/18/2020	56781	635	5594	10.57	10.57	Delivered and stored in contractors yard Item will be mixed to 60/40 by contractor

Rec of Delv Liquid Asphalt Rec of Del Emulsified Undiluted **Rec of Delv Emulsified Diluted** Prime Coat Tack Coat Seal Coat Oil & Water Check Sheet

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 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				
Total BOL Tons Delivered (Raw):		3.39		Total SQYD used:		4500.0		To convert gallons to tons use formulas: (Gal x (lb/gal)) ÷ 2000 = tons. (lbs/gal) conversions found in Standard Specs Section 109.01 pg. 67 tables	
Total BOL Tons Delivered (Diluted):		3.39		Total Gallons used:		790.0		For tons to gallons use formula: {(tons x 2000)/8.3 = Gallons	
Total Tons Placed (Diluted):		3.28		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // 33% (raw) 66% (diluted) = 33% Factor // 25% (raw) 75% (diluted) = 25% Factor. Undiluted or Delivered Diluted = 100% Factor					
Total Tons Remaining (Diluted):		0.11		Dilution % Factor:		100		109.01 Standard Plans (lb/gal) conversion factor: 8.3	
In "Remarks" box, document total tons paid per category per estimate, and indicate if item was incidental to a plantmix bid item. If payment is calculated off weighback tickets or the bill of lading, use the tons to gallons formula to calculate gallons to enter into the "Gallons" column to calculate application rate.									
Bill of Lading Tons Delivered (Per Day):						3.39		PMT #: 22	
Insp:	Date:	Station to Station:	Length (feet):	Width (feet):	SQYD:	Gallons:	Tons:	App. Rate:	Remarks:
TMH	6/7/2020	"X" 740+32 to "X" 741+32 LT.	100.0	5.0	55.56	10.00	0.04	0.18	
		"X" 741+32 to "X" 745+32 LT.	400.0	9.0	400.00	20.00	0.08	0.05	Catg. # 01 = 0.12
		"X" 878+20 to "X" 902+80 RT	2800.0	13.0	4,044.44	760.00	3.15	0.19	Catg. # 03 = 3.15
Totals:						4,500.00	790.00	3.28	0.18

Rec of Delv Liquid Asphalt Rec of Del Emulsified Undiluted Rec of Delv Emulsified Diluted **Prime Coat** Tack Coat Seal Coat 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				
Total BOL Tons Delivered (Raw):		4.00		Total SQYD used:		17374.7		To convert gallons to tons use formulas: (Gal x (lb/gal)) ÷ 2000 = tons. (lbs/gal) conversions found in Standard Specs Section 109.01 pg. 67 tables	
Total BOL Tons Delivered (Diluted):		4.00		Total Gallons used:		950.0		For tons to gallons use formula: (tons x 2000)/8.3 = Gallons	
Total Tons Placed (Diluted):		3.94		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // 33% (raw) 66% (diluted) = 33% Factor // 25% (raw) 75% (diluted) = 25% Factor. Undiluted or Delivered Diluted = 100% Factor					
Total Tons Remaining (Diluted):		0.06							
In "Remarks" box, document total tons paid per category per estimate, and indicate if item was incidental to a plantmix bid item. If payment is calculated off weighback tickets or the bill of lading, use the tons to gallons formula to calculate gallons to enter into the "Gallons" column to calculate application rate.									
Dilution % Factor:				100		109.01 Standard Plans (lb/gal) conversion factor: 8.3			
Bill of Lading Tons Delivered (Per Day):					4.00		PMT #:		10
Insp:	Date:	Station to Station:	Length (feet):	Width (feet):	SQYD:	Gallons:	Tons:	App. Rate:	Remarks:
TMH	3/20/2020	"L" 110+13 to "L" 240+44 RT.	13031.0	12.0	17,374.67	950.00	3.94	0.05	3.94 tons in Catg. # 2
Totals:					17,374.67	950.00	3.94	0.05	
Rec of Delv Liquid Asphalt Rec of Del Emulsified Undiluted Rec of Delv Emulsified Diluted Prime Coat Tack Coat Seal Coat 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				
Total BOL Tons Delivered (Raw):		4.20		Total SQYD used:		10120.0		To convert gallons to tons use formulas: (Gal x (lb/gal)) ÷ 2000 = tons. (lbs/gal) conversions found in Standard Specs Section 109.01 pg. 67 tables	
Total BOL Tons Delivered (Diluted):		4.20		Total Gallons used:		600.0		For tons to gallons use formula: (tons x 2000)/8.3 = Gallons	
Total Tons Placed (Diluted):		2.49		Common Dilution % Factors: 50% (raw) to 50% (diluted) = 50% Factor // 60%(raw) to 40%(diluted) = 60% Factor // 70%(raw) to 30%(diluted) = 70% Factor // 33% (raw) 66% (diluted) = 33% Factor // 25% (raw) 75% (diluted) = 25% Factor. Undiluted or Delivered Diluted = 100% Factor					
Total Tons Remaining (Diluted):		1.71							
In "Remarks" box, document total tons paid per category per estimate, and indicate if item was incidental to a plantmix bid item. If payment is calculated off weighback tickets or the bill of lading, use the tons to gallons formula to calculate gallons to enter into the "Gallons" column to calculate application rate.									
Dilution % Factor:				100		109.01 Standard Plans (lb/gal) conversion factor: 8.3			
Bill of Lading Tons Delivered (Per Day):					4.20		PMT #:		13
Insp:	Date:	Station to Station:	Length (feet):	Width (feet):	SQYD:	Gallons:	Tons:	App. Rate:	Remarks:
TMH	3/20/2020	"L" 5+09 to "L" 16+84 LT.	1175.0	48.0	6,266.67	400.00	1.66	0.06	Catg. # 1 = 1.66
		"S" 19+80 to "S" 48+70 LT	2890.0	12.0	3,853.33	200.00	0.83	0.05	Catg. # 2 = .83
Totals:					10,120.00	600.00	2.49	0.06	
Rec of Delv Liquid Asphalt Rec of Del Emulsified Undiluted Rec of Delv Emulsified Diluted Prime Coat Tack Coat Seal Coat Oil & Water Check Sheet									

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

DAILY WORK REPORT (DWR) – AWP (LIQUID/EMULSIFIED ASPHALTS)

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

INSPECTOR'S DWR

- 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
- Approve the DWR if everything is correct.
- If there are edits required in the DWR, Reject it.
- Notify the Inspector who created the DWR there are edits to be completed. The Inspector will be required to log into the

AWP program on a computer (not the iPad) to complete the edits.

5. Review the corrected DWR and Approve.

ITEM POSTING DWR

1. Create a DWR in AWP 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) for the Liquid/Emulsified Asphalt ton item based on the Liquid/Emulsified Asphalt Application and Payment spreadsheet.

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

Item ID	Item Description	Current Q...	Project	Category
4060120	PRIME COAT	8,226.000	UATB0C2C	01
Supplemental Description	Attention	Tot Qty Posted	Tot Qty Posted to Dt	Records
No		4,120.000	4,120.000	1

Item Posting N...	Contractor	Station/Location	Quantity Posted
1	T81072018 - ROAD & HIGHWAY BU	Sta "X" 740 + 32 to Sta "X" 745 + 32	4,120.000

Contractor* ▼ ROAD & HIGHWAY BUILDERS LLC (Prime) ▼	Attention 0
Quantity Posted ▼ 4,120.000	Units SQYD
Station From ▼ "X" 740	Agency Views None
Station From Plus ▼ 32	Location ▼ <input type="text"/>
Offset Type ▼ LT.	Measured ▼ <input type="checkbox"/>
Offset Distance ▼ <input type="text"/>	Material Set ▼ Cutback Asphalt ▼
Station To ▼ "X" 745	Plan Sheet Page Number ▼ <input type="text"/>
Station To Plus ▼ 32	Comments ▼ For details see Liquid/Emulsified Asphalt Record of App & Pmt. spreadsheet filed in 08 - Daily Record of Scale Weights. <input type="text"/>
Offset Type ▼ LT.	
Offset Distance ▼ <input type="text"/>	

Figure 11-18: Office Engineer's DWR Item Posting (Plantmix Ton Item)

NOTES for Liquid Asphalt TON (Figure 10-18):

- Station From/To: Refer to Contract plans
 - Offset Type: Enter the LT, RT, or CL.
 - Offset Dist: Enter if known
 - Comments: Reference the Liquid/Emulsified Asphalt Record of Application and Payment spreadsheet.
 - Sig. Fig. = .01
2. Approve the DWR.
 3. Generate the DWR.

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. Scan a copy of the Bill of Lading and the Material Certification and save them to the appropriate EDOC Contract Files\Material and Testing Files\Division No. 3 – Materials Division Certs and Test Reports\3.# directory.
 - Name the scanned file with the Item No. and Description (e.g., 4060100 Liquid Asphalt, Type MC-70.pdf).
 - Email the scanned 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

03904
2/15/22
97

SHIPPER/ORIGIN:
ERGON ASPHALT AND EMULSIONS, INC.
3901 WEST PONDEROSA WAY
LAS VEGAS, NV 89118
702-738-2059

Emergency Response Telephone Number:
Call CHEMTREC (1-800-424-9300)
Ergon, Inc. Contract Number 7956

BOL NUMBER: 21080

SOLD TO: LAS VEGAS PAVING CORPORATION 4420 SOUTH DECATUR BLVD LAS VEGAS NV 89103		CUSTOMER NO.: 464500 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 FRGHT: COL TIME IN/OUT: 12:30/12:40 CARRIER: LAS VEGAS PAVING TRUCK-TRLR NO.: 192025 ORDER #: AGRMNT #:	

PRODUCT	TANK	TEMP	UCM	NET VOLUME	WEIGHTS		
CSS-1H	2	150.00 F 65.61 C	UG6 LTR	747.642 2,690.133	GROSS:	41,180 LBS	18,679 KG
					TARE:	38,840 LBS	15,802 KG
					NET:	6,340 LBS	2,876 KG
						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

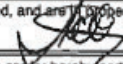
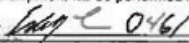
<p>This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.</p> <p>Signature by Shipper: </p>
<p>Cargo Tank Supplied 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.</p> <p>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.</p> <p>Signature by Motor Carrier:  0461</p>

Figure 11-19: 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 43620lb TARE 41180lb NET 24401b Gals: <u>292.96</u></p> <p style="text-align: right; font-size: 1.2em;"><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 / B180

Figure 11-20: Bill of Lading Water Ticket



03904

Ergon Asphalt & Emulsions, Inc.

Certificate of Analysis

Date 02/15/2022
 Product CSS-1H *tem - 4080300*
 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, %	02/15/2021 97.5	---	99.9
Ductility, 25°C, HG, 5cm/min, cm	40	---	80

Represented Qty. 500 tons

02/13/2022

Quality Assurance Manager

Date

Figure 11-21: Material Certification