

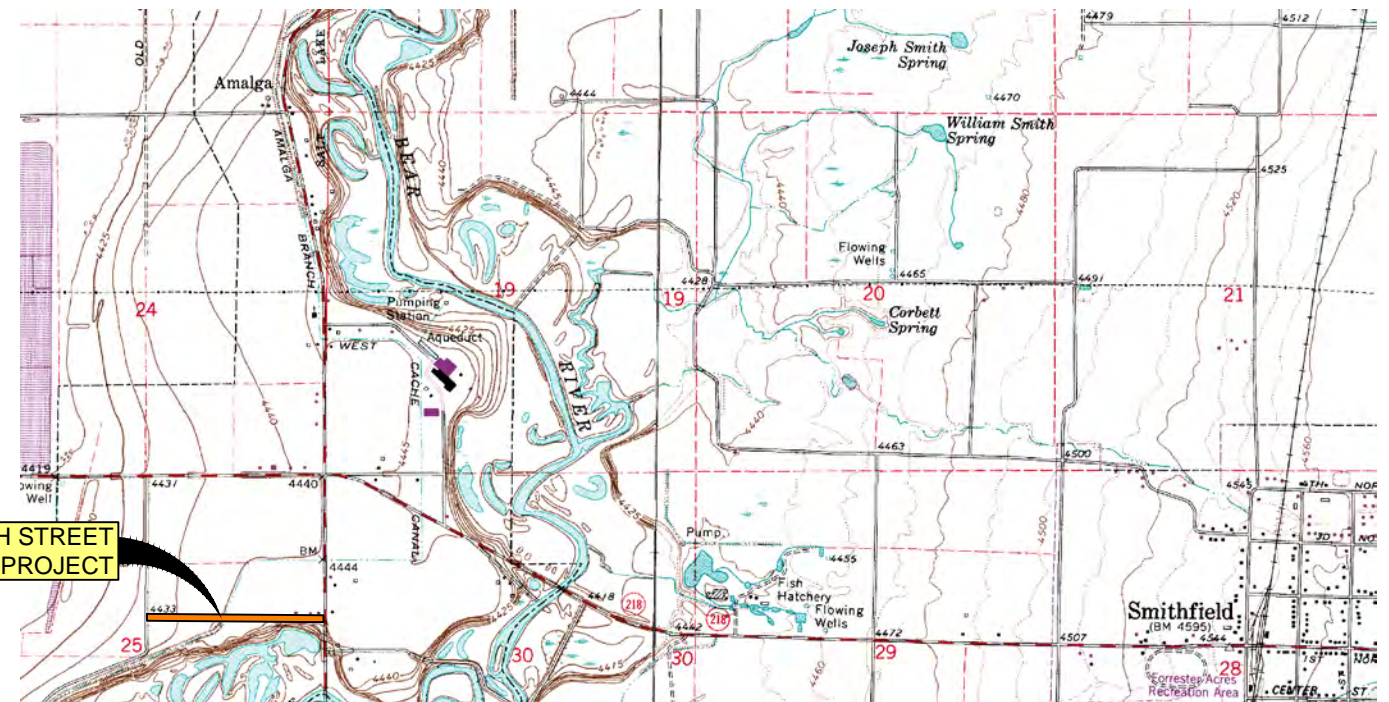
**COMPLIANCE WITH GOVERNMENTAL REGULATIONS:**

THE CONTRACTOR'S PERSONNEL, EQUIPMENT, AND OPERATIONS SHALL COMPLY FULLY WITH ALL APPLICABLE STANDARDS, REGULATIONS, AND REQUIREMENTS OF EXISTING FEDERAL, UTAH STATE, AND LOCAL GOVERNMENTAL AGENCIES. THIS SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO, THE FOLLOWING:

1. **UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS:** TITLE 29 OF THE CODE OF FEDERAL REGULATIONS, PART 1926 (29 CFR PART 1926), SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION.
2. **STANDARDS AND SPECIFICATIONS:** THE CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH ALL TOWN PUBLIC WORKS STANDARDS AND SPECIFICATIONS AND THE "MANUAL OF STANDARD SPECIFICATIONS" BY THE UTAH CHAPTER OF AMERICAN PUBLIC WORKS ASSOCIATION (APWA).
4. **UDOT REQUIREMENTS:** WHEN CROSSING OR WORKING WITHIN UTAH DEPARTMENT OF TRANSPORTATION RIGHTS-OF-WAY THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS AND COMPLY WITH ALL APPROPRIATE UDOT REGULATIONS INCLUDING APPLICABLE SECTIONS IN "STATE OF UTAH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," LATEST EDITION.
5. **PERMITS:** THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL REQUIRED BUSINESS LICENSES AND BUILDING PERMITS APPLICABLE TO THIS PROJECT. DEVELOPER/CONTRACTOR SHALL BE SUBJECT TO THE CONDITIONS OF ALL PERMITS AND AGREEMENTS BETWEEN THE OWNER AND THE PERMITTING AGENCIES.

**PUBLIC SAFETY AND CONVENIENCE:**

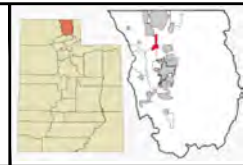
THE CONVENIENCE OF THE GENERAL PUBLIC AND THE PROTECTION OF PERSONS AND PROPERTY IS OF PRIME IMPORTANCE AND SHALL BE PROVIDED FOR BY THE CONTRACTOR DURING THIS PROJECT. THE DEVELOPER/CONTRACTOR SHALL USE EVERY REASONABLE PRECAUTION TO SAFEGUARD PERSONS AND PROPERTY. FAILURE OF THE OWNER OR THE PUBLIC WORKS REPRESENTATIVE/ENGINEER TO NOTIFY THE CONTRACTOR OF ANY DEFICIENCIES IN PROVIDING FOR PUBLIC SAFETY AND CONVENIENCE SHALL NOT RELIEVE THE CONTRACTOR FROM ITS RESPONSIBILITY. THE DEVELOPER/CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).



**PROJECT VICINITY MAP**

NO.	REVISIONS	BY	DATE

**ATTENTION**  
 LINE IS 1-INCH  
 AT 11x17 SIZE  
 IF NOT 1-INCH,  
 SCALE DRAWING ACCORDINGLY



**TOWN OF AMALGA**  
 6590 NORTH 2400 WEST  
 AMALGA, UTAH 84335

**FORSGREN**  
*Associates Inc.*  
 95 WEST 100 SOUTH, STE. 115, LOGAN, UT 84321  
 PH: 435.227.0333 FAX: 435.227.0334



**5800 NORTH STREET CHIP & FOG SEAL**  
 2700 WEST STREET TO 2400 WEST STREET

PROJECT NO:  
014-13-0002-019  
 SHEET:  
EXHIBIT NO. 1  
 DATE:  
8-2019  
 PAGE NO:  
1 of 1

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## Town of Amalga

6590 North 2400 West

[www.amalgatown.org](http://www.amalgatown.org)

### *Opinion of Probable Costs*

Project: 5800 North Street Chip & Seal  
2400 West to 2700 West  
 Owner: Town of Amalga, Utah

Project No: 014-13-0002 - 009  
 Date: 13-Aug-19  
 Case: Surface Rehabilitation

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	\$ 2,000.00	\$ 2,000
2	Prepare and Implement Traffic Control Plan	1	LS	\$ 1,500.00	\$ 1,500
3	Clean and Crack Seal Roadway	1	LS	\$ 1,850.00	\$ 1,850
4	Furnish and Place Chip & Fog Seal	5,850	SY	\$ 4.15	\$ 24,278
5	Street Sweeping & Cleanup	1	LS	\$ 1,200.00	\$ 1,200
6	Roadway Striping	2,600	LF	\$ 0.50	\$ 1,300
<b>Subtotal</b>					<b>\$ 32,128</b>
1	COG Application and Design Development				\$ 2,700
2	Engineering Support During Project Implementation				\$ 1,500
<b>Subtotal</b>					<b>\$ 4,200</b>
<b>Total</b>					<b>\$ 36,400</b>
Contingency (5%)					\$ 1,900
<b>Total Project Cost</b>					<b>\$ 38,300</b>

**FORSGREN**  
*Associates Inc.*

Town of Amalga  
2019 CCCOG Road Project Funding Application

**1 - Existing Roadway Conditions: 5800 North – Looking East**



**2 - Existing Roadway Conditions: 5800 North – Looking West**



## **SECTION 32 01 14**

### **CHIP SEAL**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Paving asphalt and cover aggregate evenly spread as a uniform, skid-resistant roadway surface treatment.

##### **1.2 REFERENCES**

- A. ASTM C 88: Standard Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
- B. ASTM C 117: Standard Method of Test for Amount of Material Finer Than 0.075 mm Sieve in Aggregate.
- C. ASTM C 131: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- D. ASTM C 136: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- E. ASTM C 142: Standard Test Method for Clay Lumps and Friable Particles in Aggregates.
- F. ASTM D 2170: Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens).
- G. ASTM D 3319: Standard Test Method for Accelerated Polishing of Aggregates Using the British Wheel.
- H. ASTM D 3628: Standard Practice for Selection and Use of Emulsified Asphalts.
- I. ASTM D 4791: Standard Test Method for Flat or Elongated Particles in Coarse Aggregate.
- J. ASTM D 5821: Standard Test Method for Determining the percentage of Fractured Particles in Coarse Aggregate.

##### **1.3 SUBMITTALS**

- A. Traffic control plan, Section 01 55 26.
- B. Mix Design: Identify.
  - 1. Type and grade of paving asphalt to be used (if not specified).
  - 2. Aggregate gradation.
  - 3. Asphalt/aggregate compatibility.
  - 4. List of asphalt additives.
- C. Equipment: Submit list of construction equipment to be used.
- D. Asphalt Bill of Lading: Identify.
  - 1. Weight of asphalt.

- 2. Weight of emulsified asphalt (after water has been added).
- E. Quality Control Report: Upon Town Engineer's request, submit a written quality control inspections and testing report describing source and field quality control activities performed by Developer's Suppliers and Developer.

#### 1.4 **QUALITY ASSURANCE**

- A. Do not change source of supply of paving asphalt or aggregate without supporting changes in mix design.
- B. Reject product that does not meet requirements of this Section.
- C. Remove any product found defective after installation and install acceptable product.

#### 1.5 **WEATHER**

- A. Temperature:
  - 1. Apply chip seal when air and roadbed temperatures in the shade are 70 deg. F. and rising.
  - 2. Allow 4 weeks of warm weather cure time. This generally limits performance of work from May 15 to August 31.
  - 3. Do not apply chip seal if Pavement surface is above 120 deg. F.
- B. Moisture: Do not apply chip seal during rain, unsuitable weather, or if humidity prolongs curing.

#### 1.6 **NOTICE**

- A. Send written notice to residents and businesses within affected area 3 days before applying chip seal.
- B. Indicate application time and when new surface can be used.
- C. Warn them of potential vehicle tow away and other construction issues affecting neighborhood.
- D. Should work not occur on the specified day, send a new notice.

#### 1.7 **ACCEPTANCE**

- A. General:
  - 1. Acceptance is by Lot. Lot size is specified below.
  - 2. Opening chip seal surface to traffic does not constitute acceptance.
- B. Material:
  - 1. Paving Asphalt: Acceptance is not specified in this Section. Refer to Section 32 12 03 for acceptance.
  - 2. Aggregate: Lot size is one day's production with 500 tons sub-lots. Collect Samples randomly from the hauling equipment and test gradation, ASTM C 136. Lot will be acceptable if,

- a. Average gradation of each sieve for Lot is within Target Grading Band for that sieve, and
  - b. Number of Samples in Lot with any sieve measurement outside of Target Grading Band does not exceed 2, and
  - c. 200 sieve gradation is not exceeded.
3. Price Adjustment: Aggregate gradation defect may be accepted if 5 percent price reduction is applied against Lot for each condition not met. Maximum price reduction for Lot is 10 percent.
- C. Placement: Accepted on a block by block basis.
- 1. Paving Asphalt: Uniform with no ridging and no bare spots.
  - 2. Aggregate:
    - a. Embedment: After rolling and evaporation, random sampling reveals large particles are embedded in the paving asphalt on their flat side to a depth of 50 percent to 70 percent.
    - b. Asphalt See-Through: Not more than 15 percent black (asphalt) can be seen through the newly laid and compacted rock chip after sweeping.

## **PART 2 PRODUCTS**

### **2.1 PAVING ASPHALT**

- A. Cationic or anionic emulsion, Section 32 12 03.
- B. Use any of the following additives to match aggregate particle charge, weather conditions and mix design.
  - 1. Anti-strip: To change or neutralize particle charges.
  - 2. Enhancer: To promote greater film thickness on the aggregate.
  - 3. High Float Agent: To improve temperature susceptibility of the asphalt and impart a gel structure to the asphalt.
  - 4. Polymer: To reduce stripping, improve coating, decrease temperature susceptibility and increase stability of mix.
  - 5. Rejuvenator: To adjust the penetration of the base asphalt or soften reclaimed asphalt.

### **2.2 COVER AGGREGATE**

- A. Material: 100 percent crushed stone, slag or other high quality particle or combination with the following physical properties.
  - 1. Angularity (fractured faces): Greater than 60 percent of particles by weight with at least 2 mechanically fractured faces or clean angular faces, ASTM D 5821.
  - 2. Hardness (toughness): Less than 30 percent wear of aggregate, ASTM C 131 unless specific aggregates having higher values are known to be satisfactory.
  - 3. Weight Loss (soundness): For combined coarse and fine aggregate, ASTM C 88,
    - a. Less than 12 percent using Na<sub>2</sub>SO<sub>4</sub>
    - b. Less than 18 percent using MgSO<sub>4</sub>

4. Polishing: Greater than 38, ASTM D 3319.
  5. Flat or Elongated Particles: 10 percent maximum of a 3:1 ratio for material retained above the 3/8 inch sieve, ASTM D 4791
  6. Friable Particles: Less than 3 percent by weight of aggregate passing the No. 4 sieve, ASTM C 142.
- B. Gradation: ASTM C 136. Graded by dry weight on a percent passing basis. Gradation must not vary from a high limit on one screen to a low on the next.

<b>Table 1 – Master Grading Band and Target Tolerance Limits</b>			
<b>Sieve</b>	<b>Grade A</b>	<b>Grade B</b>	<b>Grade C</b>
1/2 in	100	–	100
3/8 in.	85 – 100	–	70 – 90
No. 4	0 – 20	–	0 – 5
No. 8	0 – 5	85 – 100	0 – 3
No. 16	–	10 – 25	–
No. 50	–	0 – 5	–
No. 200	0 – 1	0 – 2	0 – 2

NOTES  
 (a) Portion retained on the No. 4 sieve clean and free of clay coatings.  
 (b) Portion passing No. 200 includes mineral filler, ASTM C 117.

### 2.3 MIX DESIGN

- A. Select type and grade of emulsified asphalt, ASTM D 3628.
- B. Determine asphalt application rate based upon achieving an aggregate embedment of 50 to 70 percent.

Note: It is difficult to get adequate embedment of 3/8 inch aggregate with a 0.30 gallons per square yard asphalt application rate.

## PART 3 EXECUTION

### 3.1 CONSTRUCTION EQUIPMENT

- A. Distributor truck: Use triple overpass distributor bar setting. Apply binder uniformly (no drilling).

### 3.2 PREPARATION

- A. General:
  1. Wait at least 7 days before placing chip seal on newly patched surfaces.
  2. Asphalt concrete inlay may be required if rut deformation exists in the roadway.
- B. Protection:
  1. Protect trees, plants and other ground cover from damage.

2. Prune trees per Section 32 01 93 to allow equipment passage underneath. Repair tree damage.
  3. Install invert covers.
  4. Mask Street Fixtures.
  5. Protect curb, gutter, and sidewalk from spatter, mar or overcoat.
- C. Traffic Control:
1. Control pedestrian and vehicular traffic, Section 01 55 26. Do not proceed without flaggers.
  2. Protect chip seal from traffic until cured. Cure time depends on type of asphalt emulsion and weather.
  3. Do not proceed if flaggers are required.
  4. Do not apply traffic and lane marking tape or paint until layout and placement has been verified with Town Engineer
- D. Surface Repair: Patch holes, raveled areas, and low areas with asphalt concrete.
- E. Crack Repair: Section 32 01 17.
1. Remove plant material from cracks, edges and joints.
  2. Blow cracks clean.
  3. Seal cracks with crack pouring asphalt. Remove excess asphalt.
  4. Allow crack seal to dry before applying chip seal.
- F. Cleaning:
1. Remove loose material, mud spots, sand, dust, oil, vegetation, and other objectionable material.
  2. Do not flush water over cracked Pavements.
- G. Existing Roadway Striping: Use reflective tabs to mark roadway striping before apply chip seal.
- H. Tack Coat:
1. Apply tack coat to high-absorbent, polished, oxidized, or raveled asphalt surfaces or to concrete or brick surfaces.
  2. Apply tack coat and pave over concrete Cover Collars.

### 3.3 APPLICATION

- A. Lines:
1. Mask off end of streets and intersections to provide straight lines.
  2. Make straight lines along lip of gutter and shoulders.
  3. Keep lap lines out of wheel path.
- B. Asphalt: Keep viscosity between 50 and 100 centistokes, ASTM D 2170 during application.
- C. Chips: Apply aggregate within +1 to -2 pounds per square yard of mix design.
1. Use a damp chip but not saturated. (Note. If you see water running out of the haul truck, the chips are too wet).
  2. For polymer and latex modified emulsions, apply chips immediately.



3. For other emulsions, maintain a distance of not more than 100 feet between the distributor and the chip spreader.
  4. Spread larger particles first.
  5. Hand broom the cover material, if necessary to distribute the aggregate uniformly over the surface.
- D. Blotting: If bleeding occurs, apply a blend of 25 to 50 percent hydrated lime with sand (blotting material). Use sand to cool chips.
  - E. Expose all Street Fixtures after seal coat operations.

### 3.4 **ROLLING**

- A. Use a rubber tire roller to seat aggregate. Apply at least 2 complete rolling coverages.
- B. Complete rolling before the bituminous material cools or hardens.
- C. Keep traffic off at least 4 hours or until moisture leaves the remaining chips. Sweep the surface before allowing uncontrolled traffic on the chips.

### 3.5 **FOG SEAL**

- A. Apply to chips within 24 hours of placing chips.
- B. Keep viscosity between 50 and 100 centistokes, ASTM D 2170 during application.

### 3.6 **REPAIR**

- A. Remove spatter or mar from curb, gutter and sidewalk.
- B. Remove any product found defective after installation and install acceptable product.
- C. Fill any joints or cracks that are not covered by chip seal coat. Leave no streaks, holes, bare spots, or cracks through which liquids or foreign matter could penetrate the underlying Pavement.
- D. Repair collateral damage caused by construction.

END OF SECTION