

**PERFORMANCE ACTIVITY 102**

**SURFACE REPAIRS**

**WORK DESCRIPTION 1**  
**WORK DESCRIPTION 2**  
**WORK DESCRIPTION 3**

**Patching / Minor Leveling**  
**Major Leveling / Strengthening**  
**Resurface**

## 102 SURFACE REPAIRS

### ACTIVITY DESCRIPTION

Repair pavements, paved shoulders and approaches.

#### WORK DESCRIPTION 1 Patching / Minor Leveling

Patching of potholes, restoration of the pavement edge and the leveling of small depressions and irregularities by hand using asphalt and/or with pothole patching machine using stone and emulsion.

### TRAFFIC CONTROL

#### TWO-LANE TWO-WAY ROADWAYS

Utilize intermittent mobile operations for these work activities under the following conditions:

**Condition 1** - The maximum time duration of a stop is 15 minutes if the work vehicle and/or the shadow vehicle encroach upon a travel lane more than 2 feet.

**Condition 2** - The maximum time duration of a stop is 30 minutes if the work vehicle and/or the shadow vehicle encroach upon a travel lane 2 feet or less.

**During intermittent mobile operations, utilize a shadow vehicle when the stopping sight distance interval between the work vehicle or road machinery and an approaching motorist is unavailable based upon the posted regulatory speed limit of the work location.**

Flagging operations are required for work activities that cannot be conducted under the conditions required for intermittent mobile operations.

#### TYPICAL DRAWING APPLICATIONS

##### FLAGGING OPERATIONS

<b>DRAWING 405-01-A</b>	-	FLAGGING OPERATIONS MULTIPLE FLAGGERS TWO-LANE TWO-WAY ROADWAYS PRIMARY & SECONDARY ROUTES
<b>DRAWING 405-01-B(1)</b>	-	FLAGGING OPERATIONS MULTIPLE FLAGGERS TWO-LANE TWO-WAY ROADWAYS PRIMARY & SECONDARY ROUTES STOP SIGN CONTROLLED SIDE ROADS
<b>DRAWING 405-01-B(2)</b>	-	FLAGGING OPERATIONS MULTIPLE FLAGGERS TWO-LANE TWO-WAY ROADWAYS PRIMARY & SECONDARY ROUTES 4-WAY STOP CONTROLLED INTERSECTION
<b>DRAWING 405-01-C(1)</b>	-	FLAGGING OPERATIONS MULTIPLE FLAGGERS TWO-LANE TWO-WAY ROADWAYS PRIMARY & SECONDARY ROUTES TRAFFIC SIGNAL CONTROLLED INTERSECTION LAW ENFORCEMENT OFFICER(S)
<b>DRAWING 405-01-C(2)</b>	-	FLAGGING OPERATIONS MULTIPLE FLAGGERS TWO-LANE TWO-WAY ROADWAYS PRIMARY & SECONDARY ROUTES TRAFFIC SIGNAL CONTROLLED INTERSECTION FLAGGERS

- DRAWING 405-01-D(1)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 BEGINNING at an  
 INTERSECTION with a  
 TWO-LANE TWO-WAY ROADWAY  
 DEPARTURE LANE
- DRAWING 405-01-D(2)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 TERMINATING at an  
 INTERSECTION with a  
 TWO-LANE TWO-WAY ROADWAY  
 APPROACH LANE
- DRAWING 405-01-E(1)**  
**DRAWING 405-01-E(2)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 INTERSECTIONS with  
 LOW SPEED  
 < / = 35 MPH  
 MULTILANE ROADWAYS
- DRAWING 405-01-F(1)**  
**DRAWING 405-01-F(2)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 INTERSECTIONS with  
 INTERMEDIATE SPEED to HIGH SPEED  
 40 MPH - 60 MPH  
 MULTILANE ROADWAYS
- DRAWING 405-02** - FLAGGING OPERATIONS  
 SINGLE FLAGGER OPERATION  
 LOW VOLUME  
 LOW SPEED TO INTERMEDIATE SPEED  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES

**MOBILE OPERATIONS – INTERMITTENT**

- DRAWING 535-01-A** - MOBILE OPERATIONS – INTERMITTENT  
 STOPPING SIGHT DISTANCE  
 VEHICLE TRAIN REQUIREMENTS  
 VERTICAL CURVE (HILL)
- DRAWING 535-01-B** - MOBILE OPERATIONS – INTERMITTENT  
 STOPPING SIGHT DISTANCE  
 VEHICLE TRAIN REQUIREMENTS  
 HORIZONTAL CURVE (CURVE)
- DRAWING 535-02-A** - MOBILE OPERATIONS – INTERMITTENT  
 LOW VOLUME  
 LOW SPEED  
 PRIMARY & SECONDARY ROUTES

- DRAWING 535-02-B** - MOBILE OPERATIONS – INTERMITTENT  
LOW VOLUME  
INTERMEDIATE SPEED TO HIGH SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-03-A** - MOBILE OPERATIONS – INTERMITTENT  
INTERMEDIATE VOLUME  
LOW SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-03-B** - MOBILE OPERATIONS – INTERMITTENT  
INTERMEDIATE VOLUME  
INTERMEDIATE SPEED TO HIGH SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-04-A** - MOBILE OPERATIONS – INTERMITTENT  
HIGH VOLUME  
LOW SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-04-C** - MOBILE OPERATIONS – INTERMITTENT  
HIGH VOLUME  
INTERMEDIATE SPEED TO HIGH SPEED  
PRIMARY & SECONDARY ROUTES

#### **MULTILANE SECONDARY AND PRIMARY ROADWAYS**

Utilize intermittent mobile operations for these work activities under the following conditions:

**Condition 1** - The maximum time duration of a stop is 15 minutes if the work vehicle and/or the shadow vehicle encroach upon a travel lane more than 2 feet or if the work vehicle and shadow vehicle operate within an interior travel lane.

**Condition 2** - The maximum time duration of a stop is 30 minutes if the work vehicle and/or the shadow vehicle encroach upon a travel lane 2 feet or less.

**During intermittent mobile operations, utilize a shadow vehicle when the stopping sight distance interval between the work vehicle or road machinery and an approaching motorist is unavailable based upon the posted regulatory speed limit of the work location.**

Lane closures are required for work activities that cannot be conducted under the conditions required for intermittent mobile operations.

#### **TYPICAL DRAWING APPLICATIONS**

##### **LANE CLOSURES**

- DRAWING 505-01** - LANE CLOSURE  
LOW SPEED MULTILANE  
< / = 35 MPH  
PRIMARY & SECONDARY ROUTES
- DRAWING 505-02** - DUAL LANE CLOSURE  
LOW SPEED MULTILANE  
< / = 35 MPH  
PRIMARY & SECONDARY ROUTES
- DRAWING 505-03-A** - LANE CLOSURE  
INTERMEDIATE SPEED TO HIGH SPEED  
40 MPH - 60 MPH  
MULTILANE  
PRIMARY & SECONDARY ROUTES

- DRAWING 505-04-A** - DUAL LANE CLOSURE  
TRANSITION / ACTIVITY AREAS  
INTERMEDIATE SPEED TO HIGH SPEED  
40 MPH - 60 MPH  
MULTILANE  
PRIMARY & SECONDARY ROUTES
- DRAWING 505-04-B** - DUAL LANE CLOSURE  
ADVANCE WARNING AREA  
INTERMEDIATE SPEED TO HIGH SPEED  
40 MPH - 60 MPH  
MULTILANE  
PRIMARY & SECONDARY ROUTES

**MOBILE OPERATIONS – INTERMITTENT**

- DRAWING 535-01-A** - MOBILE OPERATIONS – INTERMITTENT  
STOPPING SIGHT DISTANCE  
VEHICLE TRAIN REQUIREMENTS  
VERTICAL CURVE (HILL)
- DRAWING 535-01-B** - MOBILE OPERATIONS – INTERMITTENT  
STOPPING SIGHT DISTANCE  
VEHICLE TRAIN REQUIREMENTS  
HORIZONTAL CURVE (CURVE)
- DRAWING 535-03-A** - MOBILE OPERATIONS – INTERMITTENT  
INTERMEDIATE VOLUME  
LOW SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-03-B** - MOBILE OPERATIONS – INTERMITTENT  
INTERMEDIATE VOLUME  
INTERMEDIATE SPEED TO HIGH SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-04-A** - MOBILE OPERATIONS – INTERMITTENT  
HIGH VOLUME  
LOW SPEED  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-04-B** - MOBILE OPERATIONS – INTERMITTENT  
HIGH VOLUME  
LOW SPEED  
INTERIOR TRAVEL LANE OPERATIONS  
PRIMARY & SECONDARY ROUTES
- DRAWING 535-04-C** - MOBILE OPERATIONS – INTERMITTENT  
HIGH VOLUME  
INTERMEDIATE SPEED TO HIGH SPEED  
PRIMARY & SECONDARY ROUTES

## INTERSTATE ROADWAYS

Intermittent mobile operations may be utilized for these work activities under the following conditions:

**Condition 1** - The maximum time duration of a stop is 5 minutes if the work vehicle and/or the shadow vehicle encroach upon an adjacent travel lane due to a shoulder area inadequate to accommodate a vehicle in its entirety due to the presence of a concrete median barrier wall or a bridge parapet wall.

**Condition 2** - The maximum time duration of a stop is 30 minutes if the vehicles remain in the shoulder areas in their entirety with no encroachment upon an adjacent travel lane.

**During intermittent Condition 1 and Condition 2 mobile operations, utilize a shadow vehicle when the stopping sight distance interval between the work vehicle or road machinery and an approaching motorist is unavailable based upon the posted regulatory speed limit of the work location.**

**UTILIZE DRAWING 535-04-D(2) WHEN PEDESTRIAN WORKERS MUST ENCROACH UPON A TRAVEL LANE AND THE WORK ACTIVITIES CAN BE COMPLETED IN 15 MINUTES OR LESS.**

Lane closures are required for work activities that cannot be conducted under the conditions required for intermittent mobile operations. Dual lane closures are required for work activities in the center or interior travel lanes.

### TYPICAL DRAWING APPLICATIONS

#### LANE CLOSURES

<b>DRAWING 510-01-A</b>	-	LANE CLOSURE INTERSTATE ROUTES
<b>DRAWING 510-01-B</b>	-	LANE CLOSURE EXIT / ENTRANCE RAMPS INTERSTATE ROUTES
<b>DRAWING 510-02-A</b>	-	DUAL LANE CLOSURE TRANSITION / ACTIVITY AREAS INTERSTATE ROUTES
<b>DRAWING 510-02-B</b>	-	DUAL LANE CLOSURE ADVANCE WARNING AREA INTERSTATE ROUTES
<b>DRAWING 510-02-C</b>	-	DUAL LANE CLOSURE EXIT / ENTRANCE RAMPS INTERSTATE ROUTES

#### MOBILIZED SHOULDER OPERATIONS

<b>DRAWING 530-03</b>	-	MOBILIZED SHOULDER OPERATIONS PEDESTRIAN WORKERS – MAJOR ENCROACHMENT UPON PAVED SHOULDER ROAD MACHINERY – MAJOR ENCROACHMENT UPON TRAVEL LANE INTERSTATE ROUTES
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#### MOBILE OPERATIONS – INTERMITTENT

<b>DRAWING 535-01-A</b>	-	MOBILE OPERATIONS – INTERMITTENT STOPPING SIGHT DISTANCE VEHICLE TRAIN REQUIREMENTS VERTICAL CURVE (HILL)
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- DRAWING 535-01-B** - MOBILE OPERATIONS – INTERMITTENT  
STOPPING SIGHT DISTANCE  
VEHICLE TRAIN REQUIREMENTS  
HORIZONTAL CURVE (CURVE)
- DRAWING 535-04-D(2)** - MOBILE OPERATIONS – INTERMITTENT  
PEDESTRIAN WORKERS  
INTERSTATE ROUTES  
(MAJOR ENCROACHMENT)
- DRAWING 535-04-E** - MOBILE OPERATIONS – INTERMITTENT  
HIGH VOLUME  
HIGH SPEED  
INTERIOR TRAVEL LANE OPERATIONS  
INTERSTATE ROUTES

## **WORK DESCRIPTION 2 Major Leveling / Strengthening**

Repair severe depressions and pavement failures through utilization of a paving machine, asphalt spreader, backhoe, or motor grader.

### **TRAFFIC CONTROL**

#### **TWO-LANE TWO-WAY ROADWAYS**

Flagging operations are required for these work activities.

#### **TYPICAL DRAWING APPLICATIONS**

##### **FLAGGING OPERATIONS**

- DRAWING 405-01-A** - FLAGGING OPERATIONS  
MULTIPLE FLAGGERS  
TWO-LANE TWO-WAY ROADWAYS  
PRIMARY & SECONDARY ROUTES
- DRAWING 405-01-B(1)** - FLAGGING OPERATIONS  
MULTIPLE FLAGGERS  
TWO-LANE TWO-WAY ROADWAYS  
PRIMARY & SECONDARY ROUTES  
STOP SIGN CONTROLLED SIDE ROADS
- DRAWING 405-01-B(2)** - FLAGGING OPERATIONS  
MULTIPLE FLAGGERS  
TWO-LANE TWO-WAY ROADWAYS  
PRIMARY & SECONDARY ROUTES  
4-WAY STOP CONTROLLED INTERSECTION
- DRAWING 405-01-C(1)** - FLAGGING OPERATIONS  
MULTIPLE FLAGGERS  
TWO-LANE TWO-WAY ROADWAYS  
PRIMARY & SECONDARY ROUTES  
TRAFFIC SIGNAL CONTROLLED INTERSECTION  
LAW ENFORCEMENT OFFICER(S)
- DRAWING 405-01-C(2)** - FLAGGING OPERATIONS  
MULTIPLE FLAGGERS  
TWO-LANE TWO-WAY ROADWAYS  
PRIMARY & SECONDARY ROUTES  
TRAFFIC SIGNAL CONTROLLED INTERSECTION  
FLAGGERS

- DRAWING 405-01-D(1)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 BEGINNING at an  
 INTERSECTION with a  
 TWO-LANE TWO-WAY ROADWAY  
 DEPARTURE LANE
- DRAWING 405-01-D(2)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 TERMINATING at an  
 INTERSECTION with a  
 TWO-LANE TWO-WAY ROADWAY  
 APPROACH LANE
- DRAWING 405-01-E(1)**  
**DRAWING 405-01-E(2)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 INTERSECTIONS with  
 LOW SPEED  
 < / = 35 MPH  
 MULTILANE ROADWAYS
- DRAWING 405-01-F(1)**  
**DRAWING 405-01-F(2)** - FLAGGING OPERATIONS  
 MULTIPLE FLAGGERS  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES  
 WORK ACTIVITY AREA  
 INTERSECTIONS with  
 INTERMEDIATE SPEED to HIGH SPEED  
 40 MPH - 60 MPH  
 MULTILANE ROADWAYS
- DRAWING 405-02** - FLAGGING OPERATIONS  
 SINGLE FLAGGER OPERATION  
 LOW VOLUME  
 LOW SPEED TO INTERMEDIATE SPEED  
 TWO-LANE TWO-WAY ROADWAYS  
 PRIMARY & SECONDARY ROUTES

**MULTILANE SECONDARY AND PRIMARY ROADWAYS**

Lane closures are required for these work activities.

**TYPICAL DRAWING APPLICATIONS**

**LANE CLOSURES**

- DRAWING 505-01** - LANE CLOSURE  
 LOW SPEED MULTILANE  
 < / = 35 MPH  
 PRIMARY & SECONDARY ROUTES
- DRAWING 505-02** - DUAL LANE CLOSURE  
 LOW SPEED MULTILANE  
 < / = 35 MPH  
 PRIMARY & SECONDARY ROUTES



- DRAWING 505-03-A** - LANE CLOSURE  
INTERMEDIATE SPEED TO HIGH SPEED  
40 MPH - 60 MPH  
MULTILANE  
PRIMARY & SECONDARY ROUTES
- DRAWING 505-04-A** - DUAL LANE CLOSURE  
TRANSITION / ACTIVITY AREAS  
INTERMEDIATE SPEED TO HIGH SPEED  
40 MPH - 60 MPH  
MULTILANE  
PRIMARY & SECONDARY ROUTES
- DRAWING 505-04-B** - DUAL LANE CLOSURE  
ADVANCE WARNING AREA  
INTERMEDIATE SPEED TO HIGH SPEED  
40 MPH - 60 MPH  
MULTILANE  
PRIMARY & SECONDARY ROUTES

### **INTERSTATE ROADWAYS**

Lane closures are required for these work activities.

#### **TYPICAL DRAWING APPLICATIONS**

##### **LANE CLOSURES**

- DRAWING 510-01-A** - LANE CLOSURE  
INTERSTATE ROUTES
- DRAWING 510-01-B** - LANE CLOSURE  
EXIT / ENTRANCE RAMPS  
INTERSTATE ROUTES
- DRAWING 510-02-A** - DUAL LANE CLOSURE  
TRANSITION / ACTIVITY AREAS  
INTERSTATE ROUTES
- DRAWING 510-02-B** - DUAL LANE CLOSURE  
ADVANCE WARNING AREA  
INTERSTATE ROUTES
- DRAWING 510-02-C** - DUAL LANE CLOSURE  
EXIT / ENTRANCE RAMPS  
INTERSTATE ROUTES

### **WORK DESCRIPTION 3 Resurface**

#### **TRAFFIC CONTROL**

##### **TWO-LANE TWO-WAY ROADWAYS**

Flagging operations are required for these work activities.

#### **TYPICAL DRAWING APPLICATIONS**

##### **FLAGGING OPERATIONS**

- DRAWING 405-01-A** - FLAGGING OPERATIONS  
MULTIPLE FLAGGERS  
TWO-LANE TWO-WAY ROADWAYS  
PRIMARY & SECONDARY ROUTES

## MULTILANE SECONDARY AND PRIMARY ROADWAYS

Lane closures are required for these work activities.

### TYPICAL DRAWING APPLICATIONS

#### LANE CLOSURES

- |                         |   |  |
|-------------------------|---|--|
| <b>DRAWING 505-01</b>   | - | LANE CLOSURE<br>LOW SPEED MULTILANE<br>< / = 35 MPH<br>PRIMARY & SECONDARY ROUTES  |
| <b>DRAWING 505-02</b>   | - | DUAL LANE CLOSURE<br>LOW SPEED MULTILANE<br>< / = 35 MPH<br>PRIMARY & SECONDARY ROUTES   |
| <b>DRAWING 505-03-A</b> | - | LANE CLOSURE<br>INTERMEDIATE SPEED TO HIGH SPEED<br>40 MPH - 60 MPH<br>MULTILANE<br>PRIMARY & SECONDARY ROUTES                                     |
| <b>DRAWING 505-04-A</b> | - | DUAL LANE CLOSURE<br>TRANSITION / ACTIVITY AREAS<br>INTERMEDIATE SPEED TO HIGH SPEED<br>40 MPH - 60 MPH<br>MULTILANE<br>PRIMARY & SECONDARY ROUTES |
| <b>DRAWING 505-04-B</b> | - | DUAL LANE CLOSURE<br>ADVANCE WARNING AREA<br>INTERMEDIATE SPEED TO HIGH SPEED<br>40 MPH - 60 MPH<br>MULTILANE<br>PRIMARY & SECONDARY ROUTES        |

## INTERSTATE ROADWAYS

Lane closures are required for these work activities.

### TYPICAL DRAWING APPLICATIONS

#### LANE CLOSURES

- |                         |   |   |
|-------------------------|---|---|
| <b>DRAWING 510-01-A</b> | - | LANE CLOSURE<br>INTERSTATE ROUTES                                     |
| <b>DRAWING 510-01-B</b> | - | LANE CLOSURE<br>EXIT / ENTRANCE RAMPS<br>INTERSTATE ROUTES            |
| <b>DRAWING 510-02-A</b> | - | DUAL LANE CLOSURE<br>TRANSITION / ACTIVITY AREAS<br>INTERSTATE ROUTES |
| <b>DRAWING 510-02-B</b> | - | DUAL LANE CLOSURE<br>ADVANCE WARNING AREA<br>INTERSTATE ROUTES        |
| <b>DRAWING 510-02-C</b> | - | DUAL LANE CLOSURE<br>EXIT / ENTRANCE RAMPS<br>INTERSTATE ROUTES       |