PROPOSALS MUST BE RECEIVED BY 9:30 A.M.

CONTRACT BID DOCUMENTS

EASTERN OKLAHOMA COUNTY
CONTRACT NO. EOC-2465

BID OPENING:
OCTOBER 11, 2017 AT 10:00 A.M.

3500 Martin Luther King Avenue
Oklahoma City, OK  73111
Telephone:  (405) 425-3600

GRADE, DRAIN, PAVING AND BRIDGE
Project is located at Interchange of EOC with Turner Turnpike (I-44), approximately 0.15 miles east of the Luther Road Bridge over the Turner Turnpike (Bridge 13.3) in northeast Oklahoma County, near MM 149.

CONSULTING ENGINEERS:
Olsson Associates
201 NW 63rd Street, Suite 130
Oklahoma City, OK  73116

Driving Forward Program Manager
Poe & Associates
1601 Northwest Expressway, Suite 400
Oklahoma City, OK 73118

EOC-2465, PREPARED BY:
Olsson Associates
201 NW 63rd Street, Suite 130
Oklahoma City, OK 73116
OTA NOW REQUIRES ON-LINE BIDDING.
TO GET SIGNED UP TO BID OVER THE INTERNET
CONTACT BID EXPRESS AT
http://www.BidExpress.com or (888) 352-2439

BIDS WILL BE OPENED AT 10:00 A.M. ON
OCTOBER 11, 2017 AT OKLAHOMA TURNPIKE AUTHORITY
3500 MARTIN LUTHER KING AVENUE, OKLAHOMA CITY, OK  73111

BIDS MUST BE RECEIVED THIRTY MINUTES PRIOR TO THE BID OPENING

 CONTRACT:  EOC-2465
 TURNPIKE:  EASTERN OKLAHOMA COUNTY
 COUNTY:   OKLAHOMA
 DESCRIPTION:  GRADE, DRAIN, PAVING AND BRIDGE
 LOCATION:     INTERCHANGE OF EOC WITH TURNER TURNPIKE (I-44), APPROX. 0.15 MILES
 EAST OF LUTHER ROAD BRIDGE OVER THE TURNER TURNPIKE (BRIDGE 13.3) IN NORTHEAST OKLAHOMA COUNTY, NEAR MM 149
 LENGTH:        N/A

NOTE:  UNLESS OTHERWISE NOTED IN THE PROPOSAL, ALL BIDS MUST BE SUBMITTED OVER THE
INTERNET USING BID EXPRESS.  IF A BIDDER IS UNABLE TO SUBMIT AN ELECTRONIC BID
DUE TO CONDITIONS OUT OF THEIR CONTROL, SUCH AS, A DISABLED NETWORK SERVER,
POWER OUTAGE, OR OTHER UNFORESEEN EMERGENCY, THE BIDDER MUST REQUEST AND
GET APPROVAL TO SUBMIT A PAPER BID.  THIS WRITTEN APPROVAL SHOULD INCLUDE
JUSTIFICATION FOR THE REQUEST AND BE TAKEN TO THE OTA ASSISTANT DIRECTOR OF
ENGINEERING FOR SIGNATURE PRIOR TO THE BID OPENING.  CONTACT BRAD
MANHALTER, P.E. AT (405) 425-7004 OR BMANHALTER@PIKEPASS.COM ONCE SIGNED,
INCLUDE THE APPROVAL FORM WITH THE SUBMITTED BID.

UNIT PRICES MUST BE SHOWN IN NUMERALS FOR EACH ITEM LISTED IN THIS PROPOSAL.
PREQUALIFICATION WITH THE OKLAHOMA DEPARTMENT OF TRANSPORTATION IS REQUIRED
FOR THIS OKLAHOMA TURNPIKE AUTHORITY PROJECT AS DESCRIBED IN THE 2010 OTA
STANDARD SPECIFICATION SECTION 102.01.

AMOUNT OF CONTRACT GUARANTEE:  FIVE PERCENT (5%) OF THE BID. PLEASE BE SURE THAT
BID BONDS ARE PROPERLY EXECUTED THROUGH THE BID EXPRESS SYSTEM (OR STAPLED TO
THE BACK OF THE PROPOSAL WITH WRITTEN BID).

*******************************************************************************************
BID RIGGING IS A SERIOUS CRIME.  IF YOU HAVE ANY INFORMATION CONCERNING COLLUSIVE
BIDDING, EVEN A REQUEST TO SUBMIT A COMPLIMENTARY BID, PLEASE CALL THE OKLAHOMA
ATTORNEY GENERAL’S OFFICE AT TELE. NO 405-521-3921.
OKLAHOMA TURNPIKE AUTHORITY

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EOC-2465

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NOTICE TO CONTRACTORS

OKLAHOMA TURNPIKE AUTHORITY REQUIRES ON-LINE BIDDING. To sign up for on-line bidding contact Bid Express at www.BidExpress.com or call (888) 352-2439. All bids must be submitted over the Internet via Bid Express to the Oklahoma Turnpike Authority. NO BID WILL BE ACCEPTED AFTER 9:30 a.m. on the scheduled bid opening date: October 11, 2017. Proposals will be publicly opened at 10:00 a.m., Central Time at the Oklahoma Turnpike Authority office at 3500 Martin Luther King Avenue, Oklahoma City, OK, for the work listed below.

The Oklahoma Turnpike Authority will accept proposals from Joint Ventures on this specific project. For further information, see Joint Venture Contracting Procedures included in the proposal forms.

Amount of required Bid Bond is equal to 5% of the bid. Please make sure that bid bonds are properly executed through the Bid Express system.

This work will be done under the Oklahoma Turnpike Authority's applicable Specifications for Turnpike Construction. Unless pre-qualification is waived, these Specifications require that OTA will only accept Proposals from Bidders who are pre-qualified by the Oklahoma Department of Transportation on the date of receipt of Proposals.

Project Plans, Specifications and Bid Express will be available on September 22, 2017. Project Plans may be examined at, and purchased from:

Poe & Associates, Inc.  
1601 Northwest Expressway, Suite 400  
Oklahoma City, OK 73118  
Phone: 405-949-1962, ext. 243  
email: Helene.Murdock@poeandassociates.com

Half-size Plans $ 300  
No refunds will be made on the costs.

See IMPORTANT note below regarding the requirement to purchase project plans in order to submit a proposal on this project.

Upon award of contract to a successful bidder, the contract will be completely and correctly executed by the contractor and returned to the Authority within ten (10) working days from the date of award. The Authority will have thirty (30) working days from the date of award to complete its execution of the contract.

The Oklahoma Turnpike Authority hereby notifies all bidders that pursuant to this advertisement, disadvantaged business programs will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, sex, religion or national origin in consideration for an award.

Description of work and location of project:
Contract Number: EOC-2465  
Turnpike: Eastern Oklahoma County  
County: Oklahoma
Description: Grade, Drain, Paving and Bridge
Location: Interchange of Turner Turnpike (I-44) with Luther Road Bridge over the Turner Turnpike (Bridge 13.3) in northeast Oklahoma County, near mile marker 149.

OKLAHOMA TURNPIKE AUTHORITY - By: Tim J. Gatz, Executive Director.

ALL CONTRACTORS SUBMITTING A BID FOR THIS CONTRACT MUST ATTEND A MANDATORY PRE-BID MEETING at the Oklahoma Turnpike Authority, 3500 Martin Luther King Ave., Oklahoma City, OK on: September 29, 2017 at 9:30 a.m. This is a material requirement of this Bid Notice. Failure to attend a mandatory pre-bid meeting will cause the bid to be considered nonresponsive.

IMPORTANT: ALL CONTRACTORS SUBMITTING A BID FOR THIS CONTRACT MUST HAVE PURCHASED PROJECT PLANS AS SET FORTH ABOVE. THIS IS A MATERIAL REQUIREMENT OF THIS BID NOTICE. FAILURE TO COMPLY WILL CAUSE THE BID TO BE CONSIDERED NONRESPONSIVE. Compliance will insure the bidder is registered as a project plan holder, has the final project plans and addenda thereto, if any. The project plans and bid documents available on the OTA’s website are preliminary, are not updated and are not to be relied upon when completing and submitting a proposal.

OTA reserves the right to reject any and all proposals.
Joint Venture Contracting Procedures

In the event that the Oklahoma Turnpike Authority elects to accept proposals and enter contracts with Joint Ventures the following procedures will be followed.

1. The OTA determines the project(s) for which the OTA will accept Joint Venture proposals. A mandatory pre-bid conference is required on all projects for which OTA will accept Joint Venture proposals.

2. All firms in a Joint Venture must be prequalified by the Oklahoma Department of Transportation.

3. All firms in a Joint Venture must complete, sign and submit a “Request for Joint Venture” form (attached) at the mandatory pre-bid conference. The form must be signed by authorized officers of the firm.

4. A firm that is a part of a Joint Venture bidding on a project may not submit a separate/individual bid on the project. A firm may not be part of more than one Joint Venture bidding on a project. In the event that a firm submits more than one bid on a project, all bids involving that firm, including the Joint Venture bid, will be declared non-responsive.

5. All affidavits and E-Verify statements must be signed by all firms in the Joint Venture.

6. All firms in a Joint Venture must provide proof of insurance meeting the OTA’s minimum contractual requirements.

7. The Construction Contract will identify all firms in the Joint Venture and must be signed by all firms.

8. All firms in a Joint Venture must sign off on the required bonds, including Defect Bond, Maintenance Bond, and Statutory and Payment Bond.

9. All project payments will be made out to the lead firm in the Joint Venture.

10. All correspondence and payments regarding the project are sent to the lead firm at the lead firm’s address.
REQUEST FOR JOINT VENTURE

This form must be completed, signed and submitted at the mandatory pre-bid conference. Each individual firm which is party to the joint venture must be prequalified with the Oklahoma Department of Transportation. Please indicate below the project information, as well as denoting the lead firm, which is the firm to whom OTA will direct all correspondence and payments. OTA will not accept signatures on this form from other than an authorized officer of the firm.

Project Number:

County:

Firms involved with the Joint Venture

Lead Firm:  2nd Firm:

Address:  Address:

FEI No.:  FEI NO.:

We agree by our signatures that the firm indicated as the lead firm will be paid on behalf of the Joint Venture.

Signature:____________________________  Signature:____________________________
(Authorized Officer)  (Authorized Officer)

Date: _________________________  Date: ___________________________

If more than 2 firms are involved in the joint venture, attach a second copy of this form with the information and signatures of the other firms.
OKLAHOMA TURNPIKE AUTHORITY
CONTRACT REQUIREMENTS
EOC-2465

THE CONTRACT TIME FOR THIS PROJECT IS 330 CALENDAR DAYS.
LIQUIDATED DAMAGES FOR THIS CONTRACT WILL BE $2,000.00 PER DAY.

THE MAXIMUM DAYS ALLOWED “B” BID FOR SUBSTANTIAL COMPLETION OF THE PROJECT IS 320 CALENDAR DAYS.

THE INCENTIVE/DISINCENTIVE RATE ON THE “B” PORTION OF THE BID FOR THIS PROJECT IS $7,500 PER CALENDAR DAY.

THE MAXIMUM NUMBER OF DAYS FOR WHICH INCENTIVE WILL BE PAID ON THE “B” PORTION OF THE BID FOR THIS PROJECT IS 100 CALENDAR DAYS.

SPECIAL REQUIREMENTS FOR SUBSTANTIAL COMPLETION (“B” BID):
Time charges for the “B” Bid will begin when work begins, or Effective Date of the Notice to Proceed, whichever is earlier, and continue until substantial completion is achieved. Substantial completion will include at a minimum all traffic placed in its final lane configuration with limited lane closures (as allowed by SP 645.05 and as approved by the Engineer) to perform contract work. Limited shoulder closures will be allowed after substantial completion, as described in Special Provision 645.05 and as approved by the Engineer. Calendar days will include all coordination, required permits, approvals, construction, and any associated delays.

No time extensions shall be allowed except those specifically noted in Special Provision 102.07.

SEE SPECIAL PROVISION 102.07 “A+B BIDDING” FOR THE REQUIREMENTS OF COMPLETING THE B PORTIONS OF WORK FOR THIS PROJECT.

DISADVANTAGE BUSINESS ENTERPRISES: REQUIRED PARTICIPATION IS 0.00%.

BIDS WILL BE CONSIDERED NON RESPONSIVE AND MAY NOT BE READ IF ANY OF THE FOLLOWING THINGS HAVE BEEN DONE:

(A) Any unit price is left blank.
(B) Proposals containing any omission.
(C) Additions to Proposal.
(D) Conditions not called for.
(E) Conditional or alternate bids unless called for.
(F) A clause in which the bidder reserves the right to accept or reject a Contract awarded to him.
(G) Incomplete bids.
(H) More than one proposal from an individual, firm, partnership, joint venture or corporation whether under the same or different name.

ADDITIONAL REQUIREMENTS: Any addendum form is part of this contract. The original contract documents remain in full force and effect, except as modified by addenda which shall take precedence over any contrary or conflicting provisions in the prior documents.

Each addendum must be acknowledged by signing the Receipt of Transmission sheet of the addendum. Return as instructed on the addendum transmittal form prior to submittal of your bid.
### Notices

The Authority reserves the right to reject any bid as irregular that is found by the Authority to be either mathematically or materially unbalanced. A bid is mathematically unbalanced when the bid contains lump sum or unit bid items that do not reflect reasonable estimated costs plus a reasonable proportionate share of the bidder’s anticipated profit, overhead costs and other direct costs. A bid will be found to be materially unbalanced when that bid generates a reasonable doubt that award to the bidder submitting a mathematically unbalanced bid will result in the lowest ultimate cost to the Authority.

The Authority will consider a proposal nonresponsive and reject it in accordance with subsections 102.08 and/or 102.14 of the 2010 Oklahoma Turnpike Authority Standard Specifications for Turnpike Construction. For details and descriptions of A+B please see the attached Special Provision 102.07.
### PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>201(A)</td>
<td>CLEARING AND GRUBBING</td>
<td>LSUM</td>
<td>1.00</td>
<td>$0.00</td>
<td>$0.00</td>
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<td>202(A)</td>
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<td>202(D)</td>
<td>BEAM GUARDRAIL W-BEAM SINGLE</td>
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<td>TEST ROLLING</td>
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<tr>
<td>221(C)</td>
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<td>L.F.</td>
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<td>221(F)</td>
<td>TEMPORARY SILT DIKE</td>
<td>L.F.</td>
<td>2,800</td>
<td>$0.00</td>
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<td>221(G)</td>
<td>TEMPORARY ROCK FILTER DAM TYPE 1</td>
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<td>136.00</td>
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<td>221(K)</td>
<td>TEMPORARY FIBER LOG</td>
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<td>3,498</td>
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<td>227</td>
<td>HIGH PERFORMANCE TURF REINFORCEMENT MAT</td>
<td>S.Y.</td>
<td>592.00</td>
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<td>230(A)</td>
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<td>218,581</td>
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<td>232(B)</td>
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<td>303</td>
<td>AGGREGATE BASE TYPE A</td>
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<td>STABILIZED SUBGRADE</td>
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<td>77,995.11</td>
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<td>SEPARATOR FABRIC</td>
<td>S.Y.</td>
<td>122,360.62</td>
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**NOT FOR CONSTRUCTION**
# OKLAHOMA TURNPIKE AUTHORITY

## EOC-2465 - INTERCHANGE

**SEPTEMBER 19, 2017**

**SCHEDULE OF BID ITEMS**

## PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
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<tbody>
<tr>
<td>402(E)</td>
<td>TRAFFIC BOUND SURFACE COURSE TYPE E</td>
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<td>17,598.52</td>
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<td>ULTRA THIN BONDED WEARING COURSE (TYPE C) (PG 76-28 OK)</td>
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<td>1,573.13</td>
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<td>ITEM #</td>
<td>ITEM DESCRIPTION</td>
<td>UNIT</td>
<td>QUANTITY</td>
<td>UNIT COST</td>
<td>BID AMOUNT</td>
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<tr>
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<td>V.F.</td>
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<td>611(H)</td>
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<td>V.F.</td>
<td>2.00</td>
<td>0.00</td>
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## PART A - BASE BID

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## OKLAHOMA TURNPIKE AUTHORITY
### EOC-2465 - INTERCHANGE
#### SEPTEMBER 19, 2017
##### SCHEDULE OF BID ITEMS

### PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
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**SUBTOTAL - PART A ROADWAY**

$0.00
# OKLAHOMA TURNPIKE AUTHORITY
## EOC-2465 - INTERCHANGE
### SEPTEMBER 19, 2017
#### SCHEDULE OF BID ITEMS

## PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
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<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
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<tr>
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\*NOT FOR CONSTRUCTION\*
## PART A - BASE BID

<table>
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<th>UNIT</th>
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<th>UNIT COST</th>
<th>BID AMOUNT</th>
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**SUBTOTAL - PART A BRIDGE I**

$0.00

## PART A - BRIDGE J

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## PART A - BASE BID

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<th>BID AMOUNT</th>
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## PART A - BRIDGE K

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OKLAHOMA TURNPIKE AUTHORITY  
EOC-2465 - INTERCHANGE  
SEPTEMBER 19, 2017  
SCHEDULE OF BID ITEMS

**PART A - BASE BID**

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<thead>
<tr>
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<th>ITEM DESCRIPTION</th>
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<th>QUANTITY</th>
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<th>BID AMOUNT</th>
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**SUBTOTAL - PART A BRIDGE K**  
$0.00

**PART A - BRIDGE L**

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p. 10 of 15

**NOT FOR CONSTRUCTION**
### PART A - BASE BID

<table>
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<tr>
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<th>ITEM DESCRIPTION</th>
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<th>BID AMOUNT</th>
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# Schedule of Bid Items

**OKLAHOMA TURNPIKE AUTHORITY**  
**EOC-2465 - INTERCHANGE**  
**SEPTEMBER 19, 2017**  
**SCHEDULE OF BID ITEMS**

## PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
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<td>514(L)</td>
<td>PILE SPLICE (NON-BIDDABLE)</td>
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**SUBTOTAL - PART A  BASE BID**  
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## PART A - TRAFFIC SIGNING AND STRIPING

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**SUBTOTAL - PART A TRAFFIC SIGNING AND STRIPING**  
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<tr>
<td></td>
<td><strong>SUBTOTAL - PART A TRAFFIC SIGNING &amp; STRIPING</strong></td>
<td></td>
<td></td>
<td></td>
<td>$0.00</td>
</tr>
<tr>
<td>802(A)</td>
<td>1 1/4&quot; GALV. STEEL ELECTRICAL CONDUIT EXPOSED</td>
<td>L.F.</td>
<td>250.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>802(B)</td>
<td>2&quot; PVC SCH. 40 PLASTIC CONDUIT BORED</td>
<td>L.F.</td>
<td>450.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>802(B)</td>
<td>2&quot; PVC SCH. 40 PLASTIC CONDUIT TRENCHED</td>
<td>L.F.</td>
<td>17,985.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>802(E)</td>
<td>JUNCTION BOX (6&quot; X 6&quot; X 4&quot;)</td>
<td>EA.</td>
<td>1.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>803(A)</td>
<td>PULL BOX (SIZE I)</td>
<td>EA.</td>
<td>14.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>804(A)</td>
<td>STRUCTURAL CONCRETE</td>
<td>C.Y.</td>
<td>154.16</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>804(B)</td>
<td>REINFORCING STEEL</td>
<td>LB.</td>
<td>26,696.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>806(C)</td>
<td>40' MTG &amp; 12' HMA (G.STL.)</td>
<td>EA.</td>
<td>95.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>807</td>
<td>BREAKAWAY BASE (DES. B)</td>
<td>EA.</td>
<td>89.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>809(A)</td>
<td>ROADWAY LUMINAIRE</td>
<td>EA.</td>
<td>95.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>810(A)</td>
<td>SERVICE POLE</td>
<td>EA.</td>
<td>2.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>811</td>
<td>1/C NO. 4 ELECTRICAL CONDUCTOR</td>
<td>L.F.</td>
<td>37,370.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

**NOT FOR CONSTRUCTION**
## OKLAHOMA TURNPIKE AUTHORITY
### EOC-2465 - INTERCHANGE
### SEPTEMBER 19, 2017
### SCHEDULE OF BID ITEMS

### PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>811</td>
<td>1/C NO. 12 ELECTRICAL CONDUCTOR</td>
<td>L.F.</td>
<td>11,400.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

**SUBTOTAL - PART A TRAFFIC LIGHTING** $0.00

### PART A - TRAFFIC CONTROL

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>857(A)</td>
<td>CONSTRUCTION TRAFFIC STRIPE (PAINT)(4’ WIDE)</td>
<td>L.F.</td>
<td>50,000.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>857(F)</td>
<td>PAVEMENT MARKING REMOVAL (TRAFFIC STRIPE)</td>
<td>L.F.</td>
<td>44,000.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>871(B)</td>
<td>(SP) CONSTRUCTION ZONE IMPACT ATTENUATOR</td>
<td>S.D.</td>
<td>1,955.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>876(A)</td>
<td>(PL) TRUCK MOUNTED ATTENUATOR</td>
<td>S.D.</td>
<td>75.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>877(A)</td>
<td>DELIVER PORTABLE LONGITUDINAL BARRIER</td>
<td>L.F.</td>
<td>7,180.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>877(B)</td>
<td>RELOCATION OF PORTABLE LONGITUDINAL BARRIER</td>
<td>L.F.</td>
<td>11,305.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>878(A)</td>
<td>(SP) MODULAR GLARE SCREEN (PERMANENT)</td>
<td>L.F.</td>
<td>778.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(A)</td>
<td>(SP) ARROW DISPLAY (TYPE C)</td>
<td>S.D.</td>
<td>796.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(B)</td>
<td>(SP) CONSTRUCTION SIGNS 0 TO 25 SF</td>
<td>S.D.</td>
<td>20,247.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(B)</td>
<td>(SP) CONSTRUCTION SIGNS 26.0 TO 15.99 SF</td>
<td>S.D.</td>
<td>12,599.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(B)</td>
<td>(SP) CONSTRUCTION SIGNS 16.0 TO 32.99 SF</td>
<td>S.D.</td>
<td>16,563.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(B)</td>
<td>(SP) CONSTRUCTION SIGNS 33.00 S.F. &amp; OVER</td>
<td>S.D.</td>
<td>1,440.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(C)</td>
<td>(SP) CONSTRUCTION BARRICADES (TYPE III)</td>
<td>S.D.</td>
<td>7,422.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>880(F)</td>
<td>(SP) WING BARRICADES</td>
<td>S.D.</td>
<td>3,404.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>890(F)</td>
<td>(SP) WARNING LIGHTS (TYPE A)</td>
<td>S.D.</td>
<td>23,672.00</td>
<td>$0.00</td>
<td>$0.00</td>
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<tr>
<td>890(F)</td>
<td>(SP) DRUMS</td>
<td>S.D.</td>
<td>23,764.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>
PART A - BASE BID

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>880(K)</td>
<td>(SP) SURVEILLANCE OF TRAFFIC CONTROL</td>
<td>S.D.</td>
<td>360.00</td>
<td></td>
<td>$0.00</td>
</tr>
<tr>
<td>882(B)</td>
<td>(SP) PORTABLE CHANGEABLE MESSAGE SIGN</td>
<td>S.D.</td>
<td>2,160.00</td>
<td></td>
<td>$0.00</td>
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</tbody>
</table>

SUBTOTAL - PART A TRAFFIC CONTROL $0.00

PART A - CONSTRUCTION

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>BID AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>QUALITY CONTROL AND ACCEPTANCE</td>
<td>LSUM</td>
<td>1.00</td>
<td></td>
<td>$0.00</td>
</tr>
<tr>
<td>220</td>
<td>SWPP DOCUMENTATION AND MANAGEMENT</td>
<td>LSUM</td>
<td>1.00</td>
<td></td>
<td>$0.00</td>
</tr>
<tr>
<td>640(A)</td>
<td>FIELD OFFICE</td>
<td>EA.</td>
<td>1.00</td>
<td></td>
<td>$0.00</td>
</tr>
<tr>
<td>641</td>
<td>MOBILIZATION</td>
<td>LSUM</td>
<td>1.00</td>
<td></td>
<td>$0.00</td>
</tr>
<tr>
<td>642</td>
<td>CONSTRUCTION STAKING</td>
<td>LSUM</td>
<td>1.00</td>
<td></td>
<td>$0.00</td>
</tr>
</tbody>
</table>

SUBTOTAL - PART A CONSTRUCTION $0.00

TOTAL PART A $0.00

PART B - PROJECT PART "B" TIME

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>PROJECT &quot;B&quot; RATE</th>
<th>NUMBER OF &quot;B&quot; DAYS BID</th>
<th>BID AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>645(A)</td>
<td>PROJECT &quot;B&quot; TIME</td>
<td>$/PSRD</td>
<td>$7,500</td>
<td></td>
<td>$0</td>
</tr>
</tbody>
</table>

PART B - PROJECT PART "B" TOTAL $0

PART A + PART B = TOTAL BID AMOUNT $0.00
Submitted by _________________________________________________________________,

Select one:
   A Corporation
   A Co-partnership
   An Individual

Principal Office
________________________________________________________________________
(Address & Phone)

The Contractor is aware that the 2010 Oklahoma Turnpike Specifications, Section 108.01 states: “The Authority will not allow the Contractor to sublet, sell, assign, or otherwise dispose of the Contract, or any portion thereof, or any of the Contractor’s rights, title, or interests therein without the written or electronic consent of the Director or his authorized representative. The Contractor shall perform at least **50 percent** of the Contract amount, based on the Contract unit prices, using its own organization, unless the Contract allows a greater percentage.”

Dated at ______________, this ________ day of _____________, 20____

By ____________________________________

Title of Person Signing: ____________________________________

Page 1 of 1
OKLAHOMA TURNPIKE AUTHORITY
BUSINESS RELATIONSHIPS AFFIDAVIT

EOC-2465

STATE OF OKLAHOMA

COUNTY OF ______________

_________________________, of lawful age, being duly sworn, on oath says that he or she is the
agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of
any partnership, or other business relationship presently in effect, of which existed within one (1)
year prior to the date of this statement with the architect, engineer, or other party to the project is
as follows:

_____________________________________________________________________________________

Affiant further states that any such business relationship presently in effect of which existed
within one (1) year prior to the date of this statement between any officer or director of the
bidding company and any officer or director of the architectural or engineering firm or other party
to the project is as follows:

_____________________________________________________________________________________

Affiant further states that the names of all persons having any such business relationships and the
positions they hold with their respective companies or firms are as follows:

_____________________________________________________________________________________

(If none of the business relationships herein above mentioned exist, affiant should so state.)

_________________________________
(Signature of Affiant)

Subscribed and sworn to before me this _____ day of _____, 20___

Notary Public ______________________

My Commission Expires ______________
OKLAHOMA TURNPIKE AUTHORITY
NON-COLLUSION BIDDING CERTIFICATION

EOC-2465

STATE OF OKLAHOMA )
) SS
COUNTY _______________

A. For purposes of competitive bids, I certify:

1. I am the duly authorized agent of ___________________________________, the bidder submitting the competitive bid which is attached to this statement, for the purpose of certifying the facts pertaining to the existence of collusion among bidders and between bidders and state officials or employees, as well as facts pertaining to the giving or offering of things of value to government personnel in return for special consideration in the letting of any contract pursuant to the bid to which this statement is attached;

2. I am fully aware of the facts and circumstances surrounding the making of the bid to which this statement is attached and has been personally and directly involved in the proceedings leading to the submission of such bid; and

3. Neither the bidder nor anyone subject to the bidder’s direction or control has been a party to the following:
   a. Any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding;
   b. Any collusion with any state official or employee as to quantity, quality or price in the prospective contract, or as to any other terms of such prospective contract; and
   c. Any discussions between bidders and any state official concerning exchange of money or other thing of value for special consideration in the letting of a contract.

B. I certify, if awarded the contract, whether competitively bid or not, that neither the Contractor nor anyone subject to the Contractor’s direction or control has paid, given, or donated or agreed to pay, give, or donate to any officer or employee of the State of Oklahoma any money or other thing of value, either directly or indirectly, in procuring the contract to which this statement is attached.

Certified this _______ day of __________________, 20____.

_________________________________
(Signature)

_________________________________  ________________________________
(Print Name)      (Position in the Company)
STATE OF OKLAHOMA )
COUNTY OF____________ )

I, ________________________________, of lawful age, and having been first duly
sworn, on oath states:

1. That I am the agent authorized by the Contractor to submit the attached contract to the
State of Oklahoma. I am fully aware of the facts and circumstances surrounding the
making of the contract to which this statement is attached and have been personally and
directly involved in the procurement of this contract.

2. That the Contractor has registered and fully participates in the Status Verification
System, as required by Title 25 O.S. § 1313(B)(1), to verify the work eligibility status of
all new employees of the Contractor.

FURTHER AFFIANT SAITH NOT.

______________________________
AFFIANT

Subscribed and sworn before me this _____ day of ________________, 20__.

______________________________
Notary Public

My Commission Expires: ____________________
My Commission Number: ____________________
CONTRACT

THIS CONTRACT AND AGREEMENT made and entered into this ____________________, 2017, between the Oklahoma Turnpike Authority, an instrumentality of the State of Oklahoma, (hereinafter called the “Authority”), and ______________________________ acting as an independent contractor (hereinafter called the “Contractor”).

WITNESSETH, That for and in consideration of the payment to be made as hereafter set forth, the Contractor hereby agrees to furnish all tools, equipment, materials, and labor to build and complete Oklahoma Turnpike Authority PROJECT NO.: EOC-2465 COUNTY: OKLAHOMA TURNPIKE: EASTERN OK COUNTY LENGTH: N/A DESCRIPTION: GRADE, DRAIN, PAVING AND BRIDGE LOCATION: INTERCHANGE OF EOC WITH TURNER TURNPIKE (I-44), APPROX. 0.15 MILES EAST OF LUTHER ROAD BRIDGE OVER THE TURNER TURNPIKE (BRIDGE 13.3) IN NORTHEAST OKLAHOMA COUNTY, NEAR MM 149 as shown on the plans to be built at the unit prices bid by said Contractor, for the respective estimated quantities aggregating approximately

in accordance with the plans on file with the Oklahoma Turnpike Authority at Oklahoma City, Oklahoma, designated as PROJECT NO.: EOC-2465

and with the Oklahoma Turnpike Authority Standard Specifications for Turnpike Construction, 2010 Edition, (the “Specifications”), with the Proposal filed with the Oklahoma Turnpike Authority on October 11, 2017 (the “Proposal”); each of which is made a part hereof as though copied in full hereinafter with the Special Provisions attached hereto; and to the entire satisfaction of the Oklahoma Turnpike Authority.

It is agreed and understood between the parties hereto that the Contractor agrees to accept and the Authority agrees to pay for the work at the price stipulated in the Proposal, such payment to be in lawful money of the United States and the payment shall be made at the time and in the manner set forth in the Specifications.

The Authority’s cost of this project is estimated to be

The Contractor agrees, for the consideration above expressed, to begin work on the date designated by the Engineer. Time is of the essence of this Contract. The Contract time and rates of liquidated damages applicable to this Contract are set forth in contract provisions which are part of this Contract.
It is further agreed that the Contractor shall execute and file good and sufficient performance, defect, and statutory bond with the Oklahoma Turnpike Authority as required by law, and that said contractor shall comply with the Oklahoma Workmen’s Compensation Law and shall file a Certificate of Workman’s Compensation Insurance, then he shall file with the Oklahoma Turnpike Authority a copy of the order authorizing him to carry his own insurance.

In Witness Thereof, the Chairman, Oklahoma Turnpike Authority, or his authorized designee, pursuant to an award of contract made by or under the direction of the Oklahoma Turnpike Authority and pursuant to authority vested in him by the Oklahoma Turnpike Authority, has hereunto subscribed his name, and the said Contractor has properly executed the same.

Signed, sealed and delivered at Oklahoma City, Oklahoma, the day and year first set forth.

Approved as to form: Oklahoma Turnpike Authority

By: ________________________________

General Counsel
Date

By: ________________________________

Chairman

______________________________

Director

______________________________

Director of Engineering

______________________________

General Engineering Consultant

______________________________

An Individual – A Member of the Firm – Vice-President

______________________________

Secretary of Corporation

ACKNOWLEDGEMENT

STATE OF OKLAHOMA } 
} SS.
COUNTY OF ______________________ } 

This instrument was acknowledged before me on __________________, ________

__________________________________________
Notary Public

(SEAL)

My commission expires: _____________________________
OKLAHOMA TURNPIKE AUTHORITY
CONTRACT AFFIDAVIT
EOC-2465

STATE OF OKLAHOMA )
COUNTY__________________)

_______________________________, of lawful age, being first duly sworn, on oath says:

1. (s)he is the duly authorized agent of ______________________________, the contractor under the contract which is attached to this statement, for the purpose of certifying the facts pertaining to the giving of things of value to government personnel in order to procure said contract;

2. (s) he is fully aware of the facts and circumstances surrounding the making of the contract to which this statement is attached and has been personally and directly involved in the proceedings leading to the procurement of said contract; and

3. neither the contractor nor anyone subject to the contractor’s direction or control has paid, given or donated or agreed to pay, give or donate to any officer or employee of the state of Oklahoma any money or other thing of value, either directly or indirectly, in procuring the contract to which this statement is attached.

_______________________________                __________________________________
(Signature of Affiant)     (Name & Title)

Subscribed and sworn to before this ____ day of ______, 20___.

Notary Public ________________________________
My Commission expires: _______________________

NOT FOR CONSTRUCTION
OKLAHOMA TURNPIKE AUTHORITY
AUTHORIZATION FOR WAIVER AND DISCLOSURE OF TAX INFORMATION

EOC-2465

Pursuant to Title 68 O.S. 1990 Supp., 205 (c)(17), the undersigned contractor hereby gives the Oklahoma Tax Commission expressed permission to provide the Oklahoma Turnpike Authority information to determine that the undersigned is in compliance with all applicable tax laws. The Tax Commission is authorized to provide the Oklahoma Turnpike Authority a statement reflecting the status of contractor’s payment history and any delinquency as it relates to sales, use, franchise, withholding, income and motor fuel taxes.

It is understood that any information provided by the Tax Commission is subject to audit and does not include any reports not yet due or not received as of the date of the Oklahoma Tax Commission signature.

Answer the following questions:

1. Do you have employees subject to income tax withholding? Yes__ No__
2. Did you bring material from out of state into Oklahoma? Yes__ No__
3. Period of the contract: From _____ To_____
4. Have you held previous contracts with the Turnpike Authority? Yes__ No__
5. FEI Number: _______________
The FEI number shall be furnished when the contract documents are signed.

Name of Contractor ____________________________ Authorized Signature ____________________________

Street Address ____________________________ SEAL ____________________________

City, State, Zip Code ____________________________

For Official Use Only
Contractor is in Compliance? Yes___ No____

OTC Signature ____________________________ Date ____________________________
OKLAHOMA TURNPIKE AUTHORITY  
CHANGE ORDERS OR ADDENDA  
EOC-2465  

If this contract is governed by the Oklahoma Public Competitive Bidding Act of 1974, then Section 121 of that Act addresses statutory limitations on change orders and addenda. Specifically, 61 O.S. §121 states as follows:  

A. Change orders or addenda to public construction contracts of One Million Dollars ($1,000,000.00) or less shall not exceed a fifteen percent (15%) cumulative increase in the original contract amount.  

B. Change orders or addenda to public construction contracts of over One Million Dollars ($1,000,000.00) shall not exceed the greater of One Hundred Fifty Thousand Dollars ($150,000.00) or a ten percent (10%) cumulative increase in the original contract amount.  

C. Change orders or cumulative change orders which exceed the limits of subsection A or B of this section shall require a re-advertising for bids on the incomplete portions of the contract.  

D. If the awarding public agency does not have a governing body, the chief administrative officer of the awarding public agency shall approve change orders. The State Construction Administrator of the Construction and Properties Division of the Department of Central Services, or the administrator's designee, shall sign and execute all contracts and change orders, as they relate to state agencies.  

E. If the awarding public agency has a governing body, all change orders shall be formally approved by the governing body of the awarding public agency and the reasons for approval recorded in the permanent records of the governing body. The governing body of a municipality or technology center may delegate approval of change orders up to Forty Thousand Dollars ($40,000.00) or ten percent (10%) of any contract, whichever is less, to the chief administrative officer of the municipality or technology center or their designee, with any approved change orders reported to the governing body at the next regularly scheduled meeting.  

F. The governing body of the Oklahoma Tourism and Recreation Department is authorized, upon approval of a majority of all of the members of the Oklahoma Tourism and Recreation Commission, to delegate to the Director of the agency the authority to approve change orders on a construction contract provided that the individual change order does not exceed Twenty-five Thousand Dollars ($25,000.00) in expenditure and complies with the limits established by this section. The Administrator of the Division shall sign and execute all contracts and change orders.  

G. The Transportation Commission may, by rule, authorize the Director of the Department of Transportation to approve change orders in an amount of not to exceed Five Hundred Thousand Dollars ($500,000.00). Change orders approved by the Director shall be presented to the Transportation Commission during the next regular meeting and the reasons therefor recorded in the permanent records. The Oklahoma Turnpike Authority may authorize the Director of the Authority to approve change orders in an amount not to exceed Two Hundred Fifty Thousand Dollars ($250,000.00). Change orders approved by the Director of the Authority shall be presented to the Authority during the next regular meeting and the reasons for the orders recorded in permanent records.
H. All change orders for the Department of Transportation or the Authority shall contain a unit price and total for each of the following items:

1. All materials with cost per item;

2. Itemization of all labor with number of hours per operation and cost per hour;

3. Itemization of all equipment with the type of equipment, number of each type, cost per hour for each type, and number of hours of actual operation for each type;

4. Itemization of insurance cost, bond cost, social security, taxes, workers' compensation, employee fringe benefits and overhead cost; and

5. Profit for the contractor.

I. 1. If a construction contract contains unit pricing, and the change order pertains to the unit price, the change order will not be subject to subsection A or B of this section.

2. When the unit price change does not exceed Twenty Thousand Dollars ($20,000.00), the unit price change order computation may be based on an acceptable unit price basis in lieu of cost itemization as required in paragraphs 1, 2, 3, 4 and 5 of subsection H of this section.

3. When the unit price change exceeds Twenty Thousand Dollars ($20,000.00), any unit price for a new item established at, or below the average eighteen-month-price history for the new item may be used in lieu of cost itemization as required in paragraphs 1, 2, 3, 4 and 5 of subsection H of this section.

J. Alternates or add items bid with the original bid and contained in the awarded contract as options of the awarding public agency shall not be construed as change orders under the provisions of the Public Competitive Bidding Act of 1974.
DEFECT BOND

BOND NO.

KNOW ALL MEN BY THESE PRESENTS:

That ______________________________________________________, whose principal or home office address and telephone number are:

Street/P. O. Box ________________________________________

City, State, Zip Code _____________________________________

Telephone: (______)_________________, as Principal, and

____________________________________________________________, a corporation organized in the State of ________________________, and authorized to transact a commercial surety business in the State of Oklahoma, whose principal or home office mailing address is:

Street/P. O. Box _____________________________________________

City, State, Zip Code ____________________________________

as Surety, are held and firmly bound unto the Oklahoma Turnpike Authority, in the penal sum of not less than ___________________________________________________________($________________) in lawful money of the United States of America, said sum being equal to the estimated contract price, for the payment of which well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors and assigns, jointly and severally by these presents.

DATED this ______ day of ______________________, 20____.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, said Principal entered into a written Contract with the Oklahoma Turnpike Authority dated _____________________, 20____, for the construction or performance of:

PROJECT NO.: EOC-2465    COUNTY: OKLAHOMA

TURNPIKE: EASTERN OK COUNTY LENGTH: N/A

DESCRIPTION: GRADE, DRAIN, PAVING AND BRIDGE

LOCATION: INTERCHANGE OF EOC WITH TURNER TURNPIKE (I-44), APPROX. 0.15 MILES EAST OF LUTHER ROAD BRIDGE OVER THE TURNER TURNPIKE (BRIDGE 13.3) IN NORTHEAST OKLAHOMA COUNTY, NEAR MM 149

(hereinafter the “Project”) all in compliance with the Project plans, specifications and related documents, including all amendments or changes thereto, which documents are on file in the principal office of the Oklahoma Turnpike Authority and are incorporated herein by reference.

NOW, THEREFORE, if the Principal shall properly and timely remedy or correct all defective workmanship and materials appearing in the Project within one year from Project Completion, and if the Principal shall pay or cause to be paid all those entities who furnish labor and material to correct or remedy such defects and shall otherwise hold harmless and indemnify the Oklahoma Turnpike Authority for all costs it might incur in remedying said defects, then this obligation shall be null and void, otherwise to remain in full force and effect.
The Surety agrees that no quantity overruns, changes in the work or alterations in the contract work or documents, whether accomplished by change order, addenda or supplemental agreement, and that no deviations in the plan or mode of procedure specified in the Contract shall have the effect of releasing the Surety from all or any part of its obligations hereunder.

IN WITNESS WHEREOF, the Principal has caused this document to be executed in its name by a duly authorized officer, agent or representative, and the Surety has caused this document to be executed in its name by an authorized attorney-in-fact or corporate officer, effective as of the day and year first above written.

THE COMMISSION ON THIS BOND IS BEING PAID TO: ____________________

__________________________________

ATTEST: (Corporation)
[SEAL]

Secretary of the Corporation

__________________________________

By: _____________________________________

Individual Proprietor/ Partner/ Authorized Officer

SURETY

__________________________________

By: _____________________________________

Authorized Attorney-in-Fact or an Authorized Officer of Surety

SUBSCRIBED by the Principal’s representative before me, a Notary Public, on this _____ day of ________________________, 20___.

__________________________________

Notary Public in and for the
State of __________________________

My Commission Expires:
[SEAL]
PERFORMANCE BOND

BOND NO.

KNOW ALL MEN BY THESE PRESENTS:

That ________________________________________________________, whose principal or home office mailing address and telephone number are:

Street/P. O. Box __________________________________________
City, State, Zip Code ________________________________________
Telephone (____)______________________ as Principal, and
______________________________________________________________ corporation organized in the State of _____________________, and authorized to transact a commercial surety business in the State of Oklahoma, whose principal or home office mailing address is

Street/P. O. Box __________________________________________,
City, State, Zip Code ________________________________________,
as Surety, are held and firmly bound unto the Oklahoma Turnpike Authority, in the penal sum of not less than ______________________________________ ($_________________) in lawful money of the United States of America, said sum being equal to the estimated contract price, for the payment of which well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors and assigns, jointly and severally by these presents.

DATED this ______ day of _________________________, 20____.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, said Principal entered into a written contract with the Oklahoma Turnpike Authority dated ______________________, 20____, for the construction or performance of:

PROJECT NO.: EOC-2465 COUNTY: OKLAHOMA

TURNPIKE: EASTERN OK COUNTY LENGTH: N/A

DESCRIPTION: GRADE, DRAIN, PAVING AND BRIDGE

LOCATION: INTERCHANGE OF EOC WITH TURNER TURNPIKE (I-44), APPROX. 0.15 MILES EAST OF LUTHER ROAD BRIDGE OVER THE TURNER TURNPIKE (BRIDGE 13.3) IN NORTHEAST OKLAHOMA COUNTY, NEAR MM 149

(hereinafter the “Project”) all in compliance with the Project plans, specifications and related documents, including all amendments or changes thereto, which documents are on file in the principal office of the Oklahoma Turnpike Authority and are incorporated herein by reference.

NOW, THEREFORE, if the Principal shall properly and promptly complete the construction Project according to all the contract documents, including all subsequent amendments, changes, addenda, time extensions, alterations and supplemental agreements thereto, then this obligation shall become null and void, otherwise to remain in full force and effect.

In the event the Principal is declared by the Oklahoma Turnpike Authority to be in default and the Principal’s right to proceed with the Project work is terminated by the Oklahoma Turnpike Authority or by a court of competent jurisdiction, the Surety shall have the duty to assume and complete all the Contract work and material requirements, including all the amendments, changes, addenda, time extensions, alterations and supplemental agreements thereto. In the event the Surety fully performs its obligations hereunder the
Oklahoma Turnpike Authority acknowledges that by law the Surety is subrogated to all the Principal’s rights arising out of the Contract, including all deferred payments, retained percentage and credits due and owing to the Principal at the time of default and termination or to thereafter become due and owing under the contract documents. The Oklahoma Turnpike Authority may at its option offset against the contract earnings any indebtedness or liability which the Principal might have to the Oklahoma Turnpike Authority arising out of the bonded Project including but not limited to liquidated damages, site rental, progressive estimate overpayments and the like. After the Surety has been made whole, the Oklahoma Turnpike Authority may offset against any remaining contract earnings any indebtedness or liability of the Principal arising out of other contracts and dealings.

No quantity overruns, changes in the work, or alterations in or amendments to the contract work or documents, whether accomplished by change order, addenda or supplemental agreements and no deviations in the plan or mode or procedure specified in the Contract shall have the effect of releasing the Surety from all or any part of its obligations hereunder.

IN WITNESS WHEREOF, the Principal has caused this document to be executed in its name by a duly authorized officer, agent or representative, and the Surety has caused this document to be executed in its name by an authorized attorney-in-fact or corporate officer, effective as of the day and year first above written.

THE COMMISSION ON THIS BOND IS BEING PAID TO: _____________________

____________________________
ATTEST: (Corporation)
[SEAL]
Secretary of the Corporation
By: ______________________________
Individual Proprietor/Partner/Authorized Officer

SURETY
By: ______________________________
Authorized Attorney-in-Fact or an Authorized Officer of Surety

SUBSCRIBED by the Principal’s representative before me, a Notary Public, on this _____ day of ______________., 20__.

____________________________
Notary Public in and for the State of ____________
My Commission Expires: ___________________[SEAL]
STATUTORY PAYMENT BOND

BOND NO.

KNOW ALL MEN BY THESE PRESENTS:

That ________________________________________________________, whose principal or home office mailing address and telephone number are:

Street/P. O. Box ___________________________________________
City, State, Zip Code _______________________________________
Telephone (_____) _____________________, as Principal, and

____________________________________________________________ a corporation organized in the State of _____________________, and authorized to transact a commercial surety business in the State of Oklahoma, whose principal or home office mailing address is

Street/P. O. Box ___________________________________________
City, State, Zip Code _______________________________________
as Surety, are held and firmly bound unto the State of Oklahoma and the Oklahoma Turnpike Authority, in the penal sum of not less than _____________________________________________________________ ($_________________) in lawful money of the United States of America, said sum being equal to the estimated contract price, for the payment of which well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors and assigns, jointly and severally by these presents.

DATED this _______ day of _________________________, 20____.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, said Principal entered into a written Contract with the Oklahoma Turnpike Authority dated ______________________, 20____, for the construction or performance of:

PROJECT NO.: EOC-2465 COUNTY: OKLAHOMA

DESCRIPTION: GRADE, DRAIN, PAVING AND BRIDGE

LOCATION: INTERCHANGE OF EOC WITH TURNER TURNPIKE (I-44), APPROX. 0.15 MILES EAST OF LUTHER ROAD BRIDGE OVER THE TURNER TURNPIKE (BRIDGE 13.3) IN NORTHEAST OKLAHOMA COUNTY, NEAR MM 149 (hereafter the “Project”) all in compliance with the Project plans, specifications and related contract documents, including all amendments or changes thereto, which documents are on file in the principal office of the Oklahoma Turnpike Authority and are incorporated herein by reference.

NOW, THEREFORE, if the Principal shall (1) pay all Project indebtednesses incurred by said Principal and his/her/its subcontractors and materialmen for all labor, material, rental of machinery or equipment and repair of and parts for equipment as are used and consumed in the performance of the contract; and (2) pay all (a) state and local taxes accruing as a result of the contract, (b) liquidated damages and site
rental as may be provided for in the contract documents, and (c) any indebtedness of the Principal to the Oklahoma Turnpike Authority arising out of overpayments of progressive estimates, then this obligation shall be null and void, otherwise to remain in full force and effect.

The intent of the Principal and Surety is that this Statutory Payment Bond, including the benefits or coverages provided herein, all notice requirements and all suit limitations, shall be construed, governed and controlled by Title 61, Oklahoma Statutes, Sections 1 and 2, as those statutes exist on the effective date of the Contract, even though the language of this bond may be more or less restrictive than required by statute.

For value received the Surety agrees that no quantity overruns, changes in the work, or alterations in or amendments to the contract work or documents, whether accomplished by change order, addenda or supplemental agreement, and no deviations in the plan or mode or procedure specified in the Contract shall have the effect of releasing the Surety from all or any part of its obligations hereunder.

IN WITNESS WHEREOF, the Principal has caused this document to be executed in its name by a duly authorized officer, agent or representative, and the Surety has caused this document to be executed in its name by an authorized attorney-in-fact or corporate officer, effective as of the day and year first above written.

THE COMMISSION ON THIS BOND IS BEING PAID TO: _____________________

ATTEST: (Corporation)
[SEAL]

Secretary of the Corporation

B: Individual/Proprietor/Partner/Authorized Officer

SURETY

By: _____________________
Authorized Attorney-in-Fact or an Authorized Officer of Surety

SUBSCRIBED before me, a Notary Public, by the Principal’s representative on this _____ day of __________________, 20__.

Notary Public in and for the State of ______________

My Commission Expires:

[SEAL]
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OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 101.05
MAINTENANCE BONDS


101.05. DEFINITIONS

S. Bond

2. Maintenance Bond (Replace definition with the following:)

A bond of at least the total Contract Price to protect the Authority from defective Work and Materials for one year after Project Completion.
OKLAHOMA TRANSPORTATION AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 102
A + B BIDDING
(TRADITIONAL BID + INCENTIVE/DISINCENTIVE)

PROJECT EOC-2465


The following provisions apply unless otherwise specified in Special Provision Contract Requirements.

102.07 PREPARATION OF PROPOSAL  (Add the following:)

Submit an A + B bid proposal for the construction of this project. The “A” portion of the bid will include a price for each unit listed on the schedule of pay items. The “B” portion of the bid will include the time required to achieve substantial completion of the project. The value of time bid (“B” Bid) will be used to compute the total bid (A+B) for the purpose of comparing bids received and for determining the lowest bid. The dollar value of the contract will reflect only the extended sum of the unit prices bid as the “A” portion of the bid.

The “B” portion of the bid will also establish the time allowed to achieve substantial completion of the project, and for purposes of computing incentive payments and disincentive damages. The time bid must be less than or equal to the maximum time authorized for the “B” bid for substantial completion of the project or the bid will be considered non-responsive.

A. Contract Administration

Time will be assessed against the Contract from the time work commences, or from the Effective date of the Notice to Proceed, whichever is earlier.

“B” Time will be assessed against the contract from the time work commences, or from the Effective Date of the Notice to Proceed, whichever is earlier. The time bid (“B” Bid) will be administered in accordance with Subsection 108.08, “Incentive/Disincentive for Early/Late Completion.” The time bid (“B” Bid) to substantially complete the project includes all working and non-working days, weekends, special events, holidays, normal adverse and unusually adverse weather days, and lost time resulting from such weather conditions. Claims for delay or lost time will be considered by the Engineer on the basis of actual delay, and adjustments to the contract time or the “B” Bid may be made as appropriate for purposes of calculating incentive and disincentive payments. In order to consider any delay, it must be shown to affect the critical path of the project schedule. Disincentive charges will continue to be assessed until substantial completion is achieved, if there is no State or Federal disaster declaration. In the event that a State or Federal disaster is declared, the Contractor must exhibit the disaster directly impacted the critical path of the project before time compensation will be considered for incentive or disincentive purposes. There will be no consideration of time adjustment for disasters declared by the State or Federal Government that do not have a direct impact on the critical path for the project, nor will the State or Federal Governments duration given in the disaster declaration be considered without proof of direct critical path impact.
The time required by the Engineer for performing normal inspections, testing and review duties shall be considered as included in the time bid. Every effort will be made by the Engineer to perform normal inspection testing and review in a manner which will not delay work progress.

(1) **Incentive Payments**

Incentive payments will be administered in accordance with Subsection 108.08, “Incentive/Disincentive for Early/Late Completion.”

(2) **Disincentive Assessments**

Deductions for disincentives, including liquidated damages, will be assessed in accordance with Subsection 108.08, “Incentive/Disincentive for Early/Late Completion.”

Liquidated damages will be charged effective one minute following the expiration of the contract time and will continue until the project is completed. Liquidated damages will be assessed in addition to the disincentive assessment, if applicable, and will be charged against each progressive estimate until completion is achieved.

**B. Schedule**

Prepare and submit a Critical Path Method (CPM) analysis in accordance with Subsection 108.03.B within 30 days of the award of the contract. Submit any revisions made to the original schedule to the Engineer. Upon request, but no more than once every 30 days, prepare and submit CPM updates to the Engineer. Include costs of preparing and maintaining the CPM in other items of pay. CPM updates to the Engineer must be supplied in .PDF and .P3 or .XES extensions.

**C. Definitions**

(1) **“A” Bid** - the sum of the unit prices bid multiplied by the unit quantities as reflected in the schedule of prices in the bid proposal.

(2) **“B” Bid** - the product of the unit of time bid to achieve substantial completion of the project multiplied by the disincentive/incentive rate specified in the bid proposal.

(3) **Incentive Rate** - the rate assigned for each unit of time for construction of the project. An incentive will be earned for the time the project is substantially complete prior to the expiration of the time bid, “B” Bid, not to exceed the maximum time specified in the bid proposal.

(4) **Disincentive Rate** - a rate equal to the incentive rate that will be assessed for the time in excess of the time bid, “B” Bid, required to achieve substantial completion.

(5) **Substantial Completion** - substantial completion is as defined in Subsection 105.17.A of the Standard Specifications, and Special Provision CA000002 of the contract documents, and includes as a minimum, if such features are included in the project plans, all bridges, pavement structure, shoulder, drainage, retaining wall, permanent signing and markings, traffic signals, traffic barriers, safety appurtenances, utility and lighting work. Where in conflict, the requirements of Special Provision CA000002 will govern.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 104
UTILITY PROPERTY AND SERVICES
EOC-2465

These Special Provisions revise, amend, and where conflict, supersede applicable Sections of the Oklahoma Turnpike Authority 2010 Standard Specifications.

(Add the following:)

104.19 UTILITY RELOCATION INFORMATION

Utility facilities will be removed, relocated, adjusted and/or abandoned in place in accordance with separate agreements between the Oklahoma Turnpike Authority and the respective utility owners at the herein designated locations.

The Contractor is forewarned that a portion of such work will be under way concurrently with the Contractor's work under this Contract. No monetary or time claims will be considered from the Contractor if the utilities are relocated or clear construction by the dates indicated in the remarks for each respective utility.

The following utility forces will be working within the construction limits covered by this Contract:

1. OWNER: Level 3/Sprint

UTILITY INVOLVED AND LOCATION: There is a parallel Fiber Optic line on the right side of the present roadway for the extents of the project.

PROPOSED REARRANGEMENTS: The parallel Fiber Optic line will be relocated 7' inside the proposed CTA fence line.

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by December 1, 2017.

2. OWNER: ATT

UTILITY INVOLVED AND LOCATION: N. 164th Street, Luther Road and Ramp A.
PROPOSED REARRANGEMENTS

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by March 1, 2018.

3. OWNER: Cox Communication

UTILITY INVOLVED AND LOCATION: Ramp A and North Luther Road

PROPOSED REARRANGEMENTS:

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by December 15, 2017.

4. OWNER: OG&E Distribution/Transmission

UTILITY INVOLVED AND LOCATION: North 164th Street, Ramp A and North Luther Road

PROPOSED REARRANGEMENTS:

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by February 1, 2018.

5. OWNER: CREC

NOT FOR CONSTRUCTION
UTILITY INVOLVED AND LOCATION: North 164th Street

PROPOSED REARRANGEMENTS:

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by January 1, 2018

6. OWNER: New Dominion

UTILITY INVOLVED AND LOCATION: North 164th Street and Ramp A

PROPOSED REARRANGEMENTS: Relocation off-site from project.

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by October 18, 2017

7. OWNER: Scissortail/Kinder Morgan

UTILITY INVOLVED AND LOCATION: North 164th Street, Ramp A and North Luther Road

PROPOSED REARRANGEMENTS:

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by October 30, 2017

8. OWNER: Enable Midstream

UTILITY INVOLVED AND LOCATION:

PROPOSED REARRANGEMENTS: Crossing off-site from project
REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by February 15, 2018

9. OWNER: DCP Natural Gas

UTILITY INVOLVED AND LOCATION:

PROPOSED REARRANGEMENTS:

REMARKS: Based on available information at this time, it is anticipated that relocations can be completed by ???
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 105
CONTROL OF WORK

CONTRACT NO. EOC-2465


105.20. PARTNERING. Is hereby revised by adding the following:

Due to the intricate nature of work and/or location of this contract, all supervisory personnel of the Contractor and his Subcontractors will be required to participate in a Partnering Workshop. The purpose of the workshop is to outline the communication protocol between OTA, the Contractor, and other personnel involved throughout the execution of the contract work. The established protocol will be utilized to facilitate the informal resolution of differences in a timely manner.

The Contractor shall schedule and coordinate the workshop with OTA’s Driving Forward Program Manager. Personnel required to attend the workshop include, but are not limited to, the following:

• OTA Driving Forward Program Representative
• OTA On-Site Representative,
• OTA Maintenance Superintendent,
• OHP Supervisor,
• Contractor’s Project Superintendent and other supervisory personnel from the Contractor and his Subcontractors.

The workshop shall be held at a mutually agreed upon location and time by the OTA Construction Engineer and Contractor. If deemed necessary, a facilitator may be used to coordinate the Partnering Workshop and shall be selected jointly by the OTA Construction Engineer and Contractor.

Follow-up meetings shall be held periodically throughout the duration of the project, at the project site or another location mutually agreed to by both parties. These follow-up meetings may be in the form of a monthly progress meeting.

The establishment of a partnering charter is voluntary and does not change the legal relationship of the parties to the contract, nor relieve either party from any of the terms of the contract.

The costs incurred to conduct the Partnering Workshop shall be shared equally by the Contractor and OTA. The costs shall include, but are not limited to, the following: the meeting room(s), facilitator/coordinator expense, and meeting supplies. There will be no reimbursement for salaries, per diem, travel or related expenses of the attendees.

A separate agreement will be generated between the Contractor and OTA to address the costs incurred and method of payment. The reimbursement will not be included in the progressive pay estimates.

107.12(A). General is hereby amended as follows:

Delete the words “project specific” from the second sentence of the third paragraph.

The sentence now reads: “If the Contractor cancels, allows to lapse, fails to renew or in any way fails to keep the liability insurance policy or any other required insurance policy in full force and effect, the Authority will suspend all progress and/or final payments for the project until the required insurance is obtained.”

107.12 (B). Contractor’s Public Liability and Property Damage Liability Insurance, is hereby amended as follows:

Delete the words “specific by project number” from the first sentence of the first paragraph.

The sentence now reads: “The Contractor shall obtain an insurance policy for each project awarded by the Authority to the Contractor.”
PROSECUTION AND PROGRESS


**108.03. PROSECUTION AND PROGRESS** *(Is hereby deleted and replaced with the following):*

**A. NOTICE TO PROCEED**

The Work Order for this project will be issued in the normal time period (approximately 30 days after award of Contract). The Notice to Proceed (NTP) will be issued and the Contractor shall begin work on January 8, 2018. Time charges will begin on the date the Contractor begins work and will continue until the project is complete. The Contractor will be charged for every day once work commences, there will be no days that are considered “no work” days. Any consideration of additional time will be strictly adhered to as described in Special Provision 102.07 A+B Bidding.

The Contractor shall notify the Engineer at least fourteen (14) calendar days prior to beginning work.

**B. UTILITIES**

See Utility Information Special Provision Section 104 for Utility schedules.

**C. PROJECT SEQUENCING WITH ADJACENT PROJECTS**

There will be a project(s) under construction concurrently during Project Number EOC 2465. This Special Provision is intended to address the sequencing coordination for adjacent project(s) during construction, in the likely event that the Contractors will not complete their respective phases of adjacent projects at the same time. Cooperation, coordination, and collaboration will be expected by the Contractors and the Engineer in these difficult areas. Traffic Control will be coordinated through project meetings with the Contractors on adjacent projects. The Contractor is required to coordinate all lane closures or work area issues around this project through the Engineer and as per Section 105.07 of the OTA 2010 Standards and Specifications.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 108.07
EXTENSIONS TO THE CONTRACT TIME

CONTRACT EOC-2465

These Special Provisions revise, amend, and where in conflict, supersede applicable Sections of the

Is hereby revised by adding the following:

108.07 DETERMINATION AND EXTENSION OF CONTRACT TIME

Extensions to the Contract Time will only be considered for circumstances outlined in
Special Provision 108.03.

General.
The Contractor shall immediately notify the Engineer of a delay in accordance with Section 104.03,
“Contractor Requested Contract Revisions,” once the Contractor becomes aware of the delay, not at the
conclusion of the delay. The Contractor waives entitlement to a time extension or compensation for delay
or costs incurred before the Contractor notified the Engineer of the delay.

After notifying the Engineer of the delay, keep daily records of the labor, material, and equipment
affected by the delay. Maintain a daily record of each operation affected by the delay and the station
locations of the operations affected. The Authority will also maintain daily records of the operations and
station locations. Each Monday, compare the previous week’s daily records with the records kept by the
Authority.

Provide written notice to the Engineer within 10 business days of the results of the comparison of the
detailed records performed each Monday, and list and describe any disagreements between the records.

The Contractor’s failure to meet with the Engineer and review the Authority’s records or to list and
describe disagreements between the Contractor’s and Authority’s records shall establish that the
Authority’s records are accurate, that the Contractor accepts the records as prepared, and that the
Contractor agrees that the Authority’s records will be the basis for determining the delay and any
compensation that may be due because of the delay.

In addition to the daily records, prepare and submit written reports to the Engineer containing the
following information each Monday:

1) Number of days behind schedule.
2) A summary of all operations that have been delayed, or will be delayed.
3) In the case of a compensable delay, explain how the Authority’s act or omission delayed each
   operation.
4) Itemize and document all added costs being incurred due to the delay. Show all calculations
   related to the determination of costs.
The Contractor’s plea that the contract time was insufficient is not a valid reason for an extension of time. When the time as extended by the Authority falls on a date that is a holiday, the Engineer will extend the contract time to the next business day.

The Authority will evaluate the Contractor’s documentation and analysis and determine the time extension due, if any. The Authority will not evaluate a request for an extension of the contract time or revise the contract time unless the Contractor notifies the Authority in accordance with the contract documents and specifications.

The Engineer will evaluate delays and requests for extensions or revisions to phased or interim start or finish dates, or durations for portions of the project in the same manner as requests for an extension of the contract time for the project as a whole. Comply with the requirements of this subsection when seeking a time extension for phased or interim start or finish dates or durations.

a) Evaluation of Delays and Calculation of Time Extensions.

The Engineer will evaluate the Contractor’s request for a time extension based on the Contractor’s compliance with the following requirements:

1. Base all evaluations of delay and all calculations of the appropriate time extensions due on the schedules submitted to and accepted by the Authority and current at the time the delay occurred, not schedules created after the delay occurred.
2. The delay is on the critical path when the delay occurred.
3. The delay results in a scheduled milestone, phase or stage, or project completion date that is later than the date required by the contract.
4. When using a CPM schedule, determine the duration of delays as follows:
   1) Use time impact analysis (TIA) to identify and measure critical delays that have not yet occurred. Do not use this method to evaluate delays that have already occurred. In general terms, perform a TIA as follows:
      I) Develop a “mini” schedule for the changed work. This schedule is known as a fragnet.
      II) Identify the current accepted schedule and record the scheduled completion date on that schedule.
      III) Insert the fragnet into the current schedule by properly linking the fragnet with the existing activities in the current accepted schedule.
      IV) Recalculate the current schedule with the fragnet inserted and record this scheduled completion date.
      V) The difference in the calculated scheduled completion dates between the current schedule and the schedule calculated with a properly inserted and properly composed fragnet is the delay attributable to the changed work. The time extension due, if any, will be based on this delay.
   2) Use a contemporaneous analysis when evaluating delays that have already occurred. In general terms, perform a contemporaneous analysis as follows:
      I) Identify the most recent accepted schedule with a data date before the start of the delay being evaluated.
      II) Identify each accepted schedule in effect during the delay and the schedule with a data date that immediately follows the conclusion of the delay.
      III) Identify the critical path each day from immediately before the start of the delay to the schedule immediately following the delay.
      IV) Determine whether the delay falls on the critical path.
V) If the delay does not fall on the critical path, then no project delay occurred and no time extension is due.
VI) If the delay falls on the critical path, then determine the number of days the critical path is delayed. The time extension due, if any, will be based on this delay.

b) **Administration of Time Extensions.**
For a calendar day contract, the Authority will provide a time extension by adding calendar days to the contract time.

109.12 PRICE ADJUSTMENT FOR ASPHALT BINDER. Is hereby revised by adding the following:

A price adjustment clause is included in this contract to provide additional compensation to the Contractor or a credit to the Authority for fluctuations in asphalt binder prices. This price adjustment is dependent upon a change in the average price of asphalt binder which results in an increase or decrease in the price of products utilized on this project.

(a) Payment will be made to the contractor for monthly fluctuation in the price of asphalt binder used in performing the applicable items of Asphalt Concrete work as listed in the table below when the asphalt binder cost fluctuates by more than 3% from the base price defined below. Payments may be positive, negative, or nonexistent depending on the circumstances. Payments or deductions will only be calculated on that portion of the asphalt binder price fluctuation that exceeds the 3% specified above. Payments or deductions for the asphalt binder cost adjustment will be included in the contractor’s progressive estimates; and the payment or deduction authorized for each estimate will be based upon the algebraic difference between the quantities for applicable items of work.

(b) The Asphalt Binder Price Adjustment (ABPA) for the current estimate will be computed according to the following formula:

\[ ABPA = Q \times F \times D \]

where

\( ABPA \) = Asphalt binder price adjustment, in dollars;
\( Q \) = The algebraic difference between the quantities for the applicable items on the current estimate and the quantities shown on the previous estimate, in tons of mix;
\( F \) = The Asphalt Binder Use Factor for the applicable items of work subject to this price adjustment, as listed in Table 109:1
\( D \) = Allowable price differential, in dollars.

When the units of measure in this contract for the Items of Work listed in the table do not correspond with the units shown in the table (i.e. Asphalt Concrete paid by the square yard, etc.), those Items will not be subject to the terms of this special provision or any asphalt binder price adjustment.
### Table 109:1
Asphalt Binder Use Factor

<table>
<thead>
<tr>
<th>ITEM DESCRIPTION</th>
<th>ITEM NUMBER</th>
<th>ASPHALT BINDER USE FACTOR PER UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permeable Friction Course</td>
<td>405</td>
<td>0.062 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Open Graded Friction Surface Course</td>
<td>406</td>
<td>0.058 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type S2</td>
<td>411(A)</td>
<td>0.037 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type S3</td>
<td>411(B)</td>
<td>0.042 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type S4</td>
<td>411(C)</td>
<td>0.048 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type S5</td>
<td>411(D)</td>
<td>0.053 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type S6</td>
<td>411(E)</td>
<td>0.058 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Stone Matrix Asphalt</td>
<td>411(F)</td>
<td>0.062 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type RBL</td>
<td>411(G)</td>
<td>0.054 ton of binder per ton of mix</td>
</tr>
<tr>
<td>Superpave, Type RIL</td>
<td>411(J)</td>
<td>0.054 ton of binder per ton of mix</td>
</tr>
</tbody>
</table>
The allowable price differential, “D”, for the current estimate will be computed according to the following formulas:

When the current price, \( P \), is greater than the base price, \( P(b) \),
\[
D = P - \left[1.03 \times P(b) \right], \text{ but not less than zero.}
\]

When the current price, \( P \), is less than the base price, \( P(b) \),
\[
D = P - \left[0.97 \times P(b) \right], \text{ but not greater than zero.}
\]

\( P(b) \) = the asphalt binder base price, in dollars per ton (mton), is the Monthly Asphalt Binder Price Index for the month in which the bids for the work were received.

\( P \) = the asphalt binder current price, in dollars per ton (mton), is the Monthly Asphalt Binder Price Index for the month in which the estimate pay period ends.

The Oklahoma Department of Transportation (ODOT) will establish the Monthly Asphalt Binder Price Index each month and post the information to the ODOT website at: http://www.okladot.state.ok.us/contractadmin/pdfs/binder-index.pdf.

(c) The Monthly Asphalt Binder Price Index will be determined by calculating the average of the minimum and maximum prices for performance-graded binder using the Selling Price of PG64-22 paving grade, as listed under “Midwest/Mid-Continent Markets – MISSOURI/KANSAS/OKLAHOMA - Tulsa, Oklahoma/Southern Kansas”. The publication used to establish the Monthly Asphalt Binder Price Index will be the Asphalt Weekly Monitor® furnished by Poten & Partners, Inc. The issue of the Asphalt Weekly Monitor® used will be for the last full week in the previous month received by ODOT prior to the first day of the index month. If the specified publication ceases to be available for any reason, ODOT at its discretion will select and begin using a substitute price source or index to establish the Monthly Asphalt Binder Price.

(d) Items included in the contract that are listed in the table above are subject to adjustment in accordance with this provision regardless of any amount of overrun to the plan quantity. Any new items of work added to the contract by supplemental agreement that are listed in the table above, will be subject to the asphalt binder price adjustments in accordance with this provision. The base asphalt binder price, \( P(b) \), for any newly added eligible items will be the same \( P(b) \) as the eligible items in the contract and the new unit price established by supplemental agreement shall be determined accordingly.

201.01 DESCRIPTION (Add the following:)

The Eastern Red Cedar is an invasive native species of evergreen tree that can tolerate a wide variety of soils, and habitats. It grows ordinarily from 16 to 66 ft [5 to 20 m] tall, with a short trunk 12 to 39 in [30 to 100 cm] in diameter. The bark is reddish-brown, fibrous, and peels off in narrow strips. The leaves are of two types; sharp, spreading needle-like juvenile leaves 2.0 to 3.9 in [5 to 10 cm] long, and tightly adpressed scale-like adult leaves 0.079 to 0.16 in [2 to 4 mm] long; they are arranged in opposite crossing pairs or occasionally spirals of three. The seed cones are 0.12 to 0.28 in [3 to 7 mm] long, berry-like, dark purple-blue with a white wax cover giving an overall sky-blue color. For more information on Eastern Red Cedars visit: http://oklahomainvasivespecies.okstate.edu/eastern_redcedar.html

Eastern Red Cedars spread quickly and present a fire hazard. For these reasons the cedars are being eliminated from the highway right-of-way.

201.04 CONSTRUCTION METHODS (Add the following:)

E. Eastern Red Cedar Eradication

Remove all Eastern Red Cedars within the project right-of-way up to, and including the right-of-way line for the project site. For cedars within the project right-of-way, remove the tree so that the stump is flush with the finished slope elevation. For cedars growing on the right-of-way fence line, do not remove the trees without the approval of the Engineer, and unless the removal can be performed without damaging the right-of-way fence. Repair fence damaged by the removal of the cedars at no additional cost to the Authority.

Dispose of the cedars in accordance with Subsection 201.04.A, “Clearing,” and in a manner approved by the Engineer.

201.06 BASIS OF PAYMENT (Add the following:)

Cost of Eastern Red Cedar eradication to be included in the cost bid for Clearing and Grubbing. If no pay item exist within the contract for clearing and grubbing, include the cost of eradication in other items of work.
220.01 DESCRIPTION

This work consists of overseeing the construction and maintenance of erosion and sediment control measures, in accordance with these specifications, in compliance with the details shown in the Contract, and as approved by the Engineer. The purpose of this work is to minimize or eliminate air pollution and pollution of rivers, streams, impoundments, and private properties from the discharge of dust and/or storm water associated with construction activity.

A. Definitions

Authorization to Discharge. The document issued from ODEQ, as a result of the NOI application, serving as the official notification of the site specific permit.

BMPs (Best Management Practices). A wide range of project management practices, schedules, activities, or prohibition of practices, that when used alone or in combination, prevent or reduce erosion, sedimentation, and/or pollution of adjacent properties, water bodies, and wetlands. BMPs include temporary or permanent structural and nonstructural devices and practices.

Completion Date. See Subsection 101.05, “Definitions,” or Subsection 105.17, “Project Completion and Acceptance.”

Erosion. The detachment and movement of soil particles from their original location by force of water, wind, ice, and gravity.

Erosion Control. Erosion control reduces the potential of soil particles from being detached by the use of soil stabilizing practices. These practices are noted in the SWMP and SWPPP.

Final Stabilization. A point in time when all earth-disturbing activities are complete and permanent erosion and sediment controls are established and functional. The stabilized site is protected from erosive forces of raindrop impact and water flow. Typically, all unpaved areas except graveled shoulders, crushed aggregate base course, or other areas not covered by permanent structures are protected by either a uniform blanket of perennial vegetation (at least 70 percent of native background cover as found in the undisturbed surrounding area) or equivalent stabilization measures including but not limited to riprap, geotextiles, gabions or paved ditches.
NOI (Notice of Intent). The OPDES General Permit application form to commence earth-disturbing activities for storm water discharges on projects which have earth disturbing activities of 1 acre or more.

NOT (Notice of Termination). The OPDES General Permit application form indicating the end of earth-disturbing activities and the attainment of Final Stabilization.

OPDES. Oklahoma Pollutant Discharge Elimination System Act.

ODEQ. Oklahoma Department of Environmental Quality.

ODEQ/OPDES General Permit. The General Permit for Storm Water Discharges from Construction Activities, issued by the ODEQ under the OPDES regulations. It requires an SWPPP before earth-disturbing activities for the project. ODEQ is the regulatory, enforcement and permitting authority for the Environmental Protection Agency (EPA) in the State of Oklahoma.

Sediment Control. Sediment control minimizes detached particles from leaving the site or entering a water body by the use of structural practices. These practices are noted in the SWMP and SWPPP.

Sedimentation. Sedimentation occurs when the eroded particles are deposited in a new location.

SPRP (Spill Prevention and Response Plan). The Contractor’s detailed plan for prevention of pollution that stems from the use, containment, cleanup, and disposal of hazardous material, including petroleum products generated by construction activities and the use of construction equipment.

SWMP (Storm Water Management Plan). The Authority’s general plan for control of project-related Erosion and Sedimentation. It is developed by the Authority and included in the Contract documents. It serves as a resource for bid estimation and a framework from which the Contractor develops the project SWPPP. The SWMP normally consists of the following:

- SWMP Information Sheet;
- Site Specific Erosion and Sediment Control Plan Sheets;
- Contract Pay Items with Plan Notes;
- Summary of Temporary and Permanent Erosion and Sediment Controls; and
- Site Specific Drainage Map.

SWPPP (Storm Water Pollution Prevention Plan). The Contractor’s plan for erosion and sediment control and storm water management under the OPDES General Permit. The SWPPP is developed by incorporating pertinent information supplied by the Authority (SWMP) with the Contractor’s information and describing site-specific controls and management of issues identified for the
project based upon construction sequences and activities. See specific requirements in Subsection 220.04.C, “Contractor Responsibilities for SWPPP.”

220.02 MATERIALS

Provide materials for erosion and sediment control measures that conform to details shown in the Contract and requirements of this specification. These measures are subject to updates and amendments by the Contractor during project progression. The items, estimated quantities and locations of the control measures will be shown on the Plans, however, the Engineer may increase or decrease the quantity of these items as the need arises. The Engineer also may allow other materials and work as the need arises and as approved in writing.

220.04 CONSTRUCTION METHODS

A. General

Provide an SWPPP and a NOI in accordance with the provisions of the latest version of the OPDES General Permit for Construction Activities issued by the ODEQ on construction projects with 1 acre [0.405 ha] or more of earth disturbance. Projects to be constructed within the corporate limits of a municipality may require additional permits and compliance with additional local requirements or constraints. All projects that involve earth disturbing operations require the appropriate BMPs developed for that specific site with up-to-date amendments by the Contractor.

B. Authority Responsibilities for SWMP

The Authority will obtain dated photographs and video documentation of pre-existing project site conditions at drainage locations and evidence of vegetation density prior to utility relocation or construction. The Authority will prepare and include in the Plans the SWMP and SWMP Information. The SWMP sheets of the construction plan include:

- Nature of the activity;
- Proposed construction sequencing;
- Total site area;
- Total disturbed area;
- Runoff coefficient for pre/post construction;
- Latitude and longitude of the site;
- Basic drainage, receiving waters, and site information required for SWPPP development;
- Site Maps;
• Drainage patterns;
• Discharge locations;
• Approximate slopes;
• Limits of construction (areas of earth-disturbance and areas of no earth-disturbance or buffer zones);
• Locations of major controls;
• Temporary and permanent structural and nonstructural practices;
• Limits of right-of-way;
• Easements;
• Existing and new structures;
• Existing and proposed roadway grades;
• Wetlands and other environmental conditions;
• Notes providing special conditions for endangered and threatened species or critical habitat;
• Detours;
• Details of the description and timing of final stabilization practices; and
• Pay items and estimated pay quantities based on the above information.

The Authority will provide a partially completed NOI with the award package for completion and signature by the Contractor. Require documentation from the Contractor to ensure the ODEQ Authorization to Discharge has been obtained prior to allowing earth-disturbing activities to commence.

C. Contractor Responsibilities for SWPPP

Submit for review by the Engineer at the preconstruction conference as required by Subsection 108.02, “Notice to Proceed and Preconstruction Conference,” SWPPPs that address:

• Intended sequence of construction with a proposed schedule of activities.
• All required erosion and sediment control measures for each construction phase.
• Compliance with the provisions of the latest version of the OPDES General Permit, which include but are not limited to the following items or activities:

• SWMP and SWPPP

• Copy of completed NOI with Contractor information and the ODEQ Authorization to Discharge.

• The proposed dates and locations of planned and actual clearing and grubbing activities, earthwork activities, and construction of temporary and permanent erosion control features.

• A description, location and schedule of temporary and permanent best management practices.

• A description, location and schedule of control practices used to divert flows from exposed soils.

• A description of construction material storage and controls used to minimize pollution from these materials.

• A prepared Spill Prevention and Response Plan.

• A description of the existing vegetation density within the project limits and adjacent land. (Include pictures and video, documented by date and location.)

• Documentation of existing conditions of streams and water courses prior to earth-disturbing activities. (Include pictures and video documented by date and location.)

• Current OPDES General Permit is available on the project site.

• How vehicle tracking will be prevented, reduced, or repaired during the project.

• Names, titles, companies, and 24 hr contact information, of people responsible for erosion and sediment control.

• A signed qualification narrative provided by the Contractor, designating the person(s) responsible for the SWPPP, identifying their familiarity with the SWPPP, and documenting their training and experience.

A Contractor Certification statement for subcontractors is recommended. This document places the responsibility of complying with and abiding by the intent and
purpose of the storm water permit with the subcontractor for any and all work performed under the authority and direction of the Contractor. A sample certification statement may be obtained on ODEQ’s website at www.deq.state.ok.us. Go to Water Quality, General Permits, Storm Water, OKR10 Storm Water Discharges from Construction Activities, Addendum D.

Develop the SWPPP using a combination of structural, nonstructural, and vegetative BMPs to adequately control erosion and sedimentation and manage storm water. Modify the SWPPP as needed to address changes in the field that develop during construction. Submit amendments to the SWPPP for approval as work progresses or as the proposed phasing/scheduling changes.

Provide a copy of ODEQ NOI and Authorization to Discharge to the Engineer before commencement of earth disturbing activities. Failure to obtain the ODEQ Authorization to Discharge will not be a basis for delaying time charges.

Identify Contractor personnel responsible for on-site inspection of storm water management and documentation procedures to be used in accordance with Subsection 220.04.H(4), “Inspection and Maintenance of Measures.”

D. Retention of Records

The SWPPP is a dynamic document. Retain and maintain all changes made to the SWPPP as required by the latest version of the OPDES General Permit. This will be the official record. Retain and place in the SWPPP a copy of the permit language and all inspection and maintenance reports. Retain inspection and maintenance reports from the commencement of earth disturbing activities to the completion date of the project. Make these records available to ODEQ or other regulatory agencies during normal business hours. Provide copies to ODOT of any and all ODEQ inspection reports, warning letters, technical assistance, Notice of Violation, Consent Order and/or Administrative Compliance Orders. Submit the official SWPPP and all inspection and maintenance reports to the Engineer at the completion of the project.

E. Notice of Intent (NOI)

Complete the mailing information, construction dates, and sign the Contractor’s NOI provided with the Contract award package to the ODEQ prior to the preconstruction conference. Provide to the Engineer copies of the submitted NOI for review at the preconstruction conference and the Authorization to Discharge certificate prior to earth disturbing activities. At the preconstruction meeting, indicate your understanding of the terms and conditions of the OPDES General Permit and that you will fully implement and maintain the SWPPP as proposed or modified during the progress of the project.

F. Notice of Termination (NOT)

The NOT must be submitted by the Contractor to the ODEQ. The Contractor will submit a copy of the NOT and ODEQ’s final inspection report to the Engineer. ODEQ’s final inspection must not have any critical exceptions for the project to be declared complete and the Contractor relieved of any related construction site responsibilities, in accordance with Subsection 105.17 “Project Completion and MANAGEMENT OF EROSION, SEDIMENTATION, AND SWPPP & CONTROL

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Acceptance.” ODEQ will require the Contractor to apply for a new permit if the project does not have 70 percent stabilization or any other discrepancies are found. ODEQ offers a one-time Inspection Request form that will aid the Contractor in determining whether a project will be accepted for termination before it submits the NOT.

G. Off-Site Pollution Prevention Plan

Prepare and submit SWPPP documentation complying with the latest version of the OPDES General Permit to ODEQ for all related work to take place outside the project right-of-way. Submit copies of required SWPPP’s storm water permit documents for borrow pits, work/maintenance yards, and waste disposal yards, asphalt and concrete plants dedicated to the project to the Engineer at least 48 hr before related work starts. Install, repair, and maintain BMPs outside of the project limits at no additional cost to the Authority.

H. Contractor’s Operations

Keep to a minimum project activity within the right-of-way in areas other than on the paved roadway to prevent damage and destruction of existing vegetation.

Keep all construction areas in an orderly condition and promptly dispose of all refuse and discarded materials.

Repair or replace erosion and sediment control measures damaged due to negligence, improper installation, or lack of maintenance at no additional cost to the Authority.

(1) Sequence of Operations

Schedule and conduct an on-site inspection with the Engineer to review and designate the locations and types of erosion and sediment control protection to be placed prior to beginning any work that will disturb existing vegetation. Indicate on the SWPPP, proposed erosion and sediment control devices used to divert flows, store flows, limit runoff from exposed areas, stabilize exposed soil, and filter sediments for each phase of the scheduled work.

Coordinate the placement of the temporary and permanent erosion and sediment control measures shown in the SWMP with up-to-date documented amendments to ensure effective and continuous erosion and sediment control throughout construction.

Do not initiate earth-disturbing operations until the Engineer has reviewed the SWPPP and the appropriate erosion control measures are in place.

(2) Protection of Watercourses

Locate and construct waste disposal areas, maintenance and storage yards, and haul roads within the project limits in a manner that will prevent sediment and other pollutants from entering streams and water impoundment areas or leaving the project site.
Do not operate mechanized equipment in perennial streams, unless otherwise allowed in the Contract.

Clear streambeds and watercourses, as soon as practical of false work, piling, debris, and other obstructions placed during construction which are not part of the finished work. Do not deposit concrete waste or clean haul trucks in these areas. Recover slurry from drill shaft operations and remove it from the project. Do not allow slurry to flow into streambeds.

(3) Earthwork Operations

Protect excavation or embankment slopes as construction progresses. A maximum length of 1 mi [1.6 km] may be exposed without either placement of temporary (eg. seeding, mulching, soil retention blankets, or other approved soil stability), or permanent (eg. seeding, sprigging, or sodding) erosion control measures. Obtain approval from the Engineer in the preconstruction schedule for any increase or decrease in the amount of the area exposed by construction operations. In addition to the maximum exposed surface area, no exposed area shall remain unprotected for more than 14 calendar days without being stabilized. Stabilize areas within 50 ft [15 m] of any streams within 48 hr of inactivity of construction operations. Install temporary or permanent erosion or sediment control measures on excavation or embankment slopes as work progresses in vertical increments of not more than 10 ft [3 m] unless otherwise directed by the Engineer.

Maintain the top of the subgrade in all roadway sections through all construction stages so as to prevent silt from leaving the construction limits.

(4) Inspection and Maintenance of Measures

Inspect and document all measures at least once every 7 calendar days and within 24 hr of ½ in [12.5 mm] or greater rainfall event. Maintain all erosion and sediment control measures in accordance with the specifications at all times during the life of the Contract for all disturbed areas, material storage areas, discharge locations, drainage structures and vehicle entrances/exits for off-site tracking. Repair damaged measures; remove trapped sediment, and correct measures that are not working within 3 calendar days. Initiate repairs as needed or as directed by the Engineer within 1 calendar day of damage occurring to erosion or sediment control measures that could result in discharge of sediment into streams, water impoundments, or other nearby bodies of water.

Remove accumulated silt before the control measures reach 50 percent capacity. Document each inspection of erosion and sediment control measures on a SWPPP Inspection and Maintenance Report form approved by the Engineer, or a form proposed by the Contractor and accepted by the Engineer. Submit copies of the completed inspection forms signed by qualified personnel to the Engineer within 24 hr of the inspections. Install a rain gauge at the project site, or use other means approved by the Engineer, and document rainfall amounts in the inspection schedule or reports.
(5) Removal of Control Measures

Remove all temporary erosion and sediment control features from the project area when no longer required, unless otherwise designated in the Contract or directed by the Engineer. Restore the areas of removal as close as possible in order to meet the previous ground lines, cover, and features.

Obtain approval from the Engineer to deposit sediment removed from control features within the right-of-way. If silt is disposed in stabilized areas, re-stabilize the area at no cost as directed by the Engineer.

I. Storm Water Compliance Inspections

The Contractor shall perform periodic storm water compliance inspections and document each inspection in accordance with Subsection 220.04.H.4 “Inspection and Maintenance Measures.” The Engineer shall perform periodic inspections for compliance with OPDES Permit or General Permit requirements and SWPPP documentation and control measures. The ODEQ may inspect for compliance with NOI requirements at any time until the NOT is submitted.

220.05 METHOD OF MEASUREMENT

SWPPP documentation and management will be measured on a lump sum basis.

Properly installed and maintained erosion and sediment control applications in accordance with the specifications within the right-of-way or as approved by the Engineer will be measured under other items of work.

Erosion and sediment control applications attributed to the Contractor’s negligence, carelessness, lack of maintenance or are outside the right-of-way for material source or waste sites, haul roads, equipment storage and Contractor offsite facilities will not be measured for payment.

Non-Compliance Damages. The Authority believes that the OPDES program is an integral part of the project and any failure to maintain the measures in the field or lack of orderly documentation, including but not limited to continuous inspection reports and revisions of the SWPPP, may result in non-compliance citations by the ODEQ and/or other local, state and federal agencies. The Authority will consider one or more of the following actions for failure to comply:

• Withhold a portion of payment for the lump sum item for SWPPP documentation and management;
• Withhold progressive payments for the project;
• Stop work on the project;
• Suspension of bidding for the Contractor;
• Apply non-compliance assessments in accordance with Subsection 220.06.B, “Non-Compliance Assessment”; or
• The Engineer will proceed to maintain the project in accordance with Subsection 105.14, “Maintenance During Construction.”

220.06 BASIS OF PAYMENT

Approved documentation of NOI, Authorization to Discharge, initial and updated SWPPPs, inspections, inspection reports, and acceptance of NOT by ODEQ will be paid at contract unit price as follows:

Pay Item: SWPPP DOCUMENTATION AND MANAGEMENT
Pay Unit: Lump Sum

Such payment shall be full compensation for furnishing all materials, equipment, labor, annual ODEQ permit fee and incidentals to complete the work as specified. Temporary erosion, sedimentation and storm water pollution prevention and control pay items will be measured for payment under the relevant pay items in Chapter 200, “Soils.”

Payment for this item of work shall be on the following schedule:
• 10 percent for approved earth disturbing SWPPP documentation,
• 15 percent when 25 percent of the Contract work is completed,
• 25 percent when 50 percent of the Contract work is completed,
• 25 percent when 75 percent of the Contract work is completed, and
• 25 percent when 100 percent stabilization has been obtained, all temporary erosion and sediment control devices have been removed and the storm water permit has been terminated.

Non-compliance assessment

<table>
<thead>
<tr>
<th>Table 220:1</th>
<th>Non-Compliance Assessment Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Disturbed Area shown on the SWMP sheet, acre [ha]</td>
<td>Rates per Calendar Day</td>
</tr>
<tr>
<td>From</td>
<td>To &amp; Including</td>
</tr>
<tr>
<td>1 [0.4]</td>
<td>5 [2]</td>
</tr>
</tbody>
</table>
If the Engineer determines it to be appropriate, non-compliance assessments will be charged in accordance with Table 220:1 for failure to comply with the procedures specified in Subsection 220.04.H, “Contractor’s Operations,” failure to document inspection and maintenance activities specified in Subsections 220.04.C, 220.04.D, 220.04.E, 220.04.F, and 220.04.G, or failure to document, install, or maintain field changes in erosion control measures in a timely and prescribed manner as directed in writing by the Engineer. The Engineer will provide written notice of non-compliance to the Contractor with a time line for accomplishment before assessments are applied. The Engineer will compile a schedule of calendar days for each and every day of non-compliance by the Contractor. The compiled schedule of calendar days will form the basis for charging the non-compliance assessments.

Non-compliance assessments will continue until the Engineer provides written notice of satisfactory compliance with these specifications to the Contractor.

In addition to any Non-Compliance Assessments:

Indemnify and hold harmless the Authority, officers, and employees from all acts and/or failure to act by the Contractor, his/her officers, employees or agents and any other subcontractors which result in damages to the environment or to third parties or which are found to violate a rule or regulation of any regulatory agency.

Reimburse the Authority for the actual cost of any reasonable legal fees, liability, damage judgment or finding, fine, penalty, or expenses as a result of Contractor’s negligent acts or violations of the above noted laws in its performance of the Contract.

Reimburse the Authority within 10 calendar days of the amount of assessment, damage judgment or finding, fine, penalty, or expense or the Authority may withhold this amount from the Contractor’s next pay estimate or claim against the Contractor’s bond if estimates are inadequate and deliver that sum to the permitting agencies issuing the assessment, damage judgment or finding, fine, or penalty.

These assessments are not to be construed as a penalty but are actual damages to recover the costs assessed against the Authority due to the Contractor’s failure to comply with the above requirements.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 227
HIGH PERFORMANCE TURF REINFORCEMENT MAT (HPTR)
AND ANCHOR REINFORCED VEGETATION SYSTEM (ARVS)
EOC-2465


(Add the following:)

227.01 DESCRIPTION

This work consists of providing and installing High Performance Turf Reinforcement Mat (HPTRM) or Anchor Reinforced Vegetation System (ARVS) for slope protection, earth retention, ditch lining, and channel protection.

227.02 MATERIALS

A. HPTRM

a) Provide a woven HPTRM consisting of non-degradable polypropylene synthetic fibers processed in a three-dimensional matrix meeting the specifications in Table 227.1.

b) The HPTRM matrix must be stabilized against ultraviolet degradation and inert to chemicals normally encountered in natural soil environment.

c) The HPTRM must have a closely woven, homogenous matrix not composed of layers or discontinuous material held together by stitched or glued netting.

d) HPTRM Properties: Minimum Average Roll Values (MARV) listed unless otherwise specified. Typical values are not allowed.

e) The HPTRM should meet the following values:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Test Parameters</th>
<th>Units</th>
<th>Property Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Per Unit Area 1</td>
<td>ASTM D-6566</td>
<td>Minimum</td>
<td>oz/yd²</td>
<td>13.5</td>
</tr>
<tr>
<td>Thickness 1</td>
<td>ASTM D-6525</td>
<td>Minimum</td>
<td>in</td>
<td>0.40</td>
</tr>
<tr>
<td>Light Penetration 2 (% Passing)</td>
<td>ASTM D-6567</td>
<td>Maximum</td>
<td>percent</td>
<td>10</td>
</tr>
<tr>
<td>Tensile Strength 1</td>
<td>ASTM D-6818</td>
<td>Minimum</td>
<td>lb/ft</td>
<td>4,000 x 3,000</td>
</tr>
</tbody>
</table>

NOT FOR CONSTRUCTION
<table>
<thead>
<tr>
<th>Tensile Elongation ¹</th>
<th>ASTM D-6818</th>
<th>Minimum</th>
<th>percent</th>
<th>40 x 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resiliency ¹</td>
<td>ASTM D-6524</td>
<td>Minimum</td>
<td>percent</td>
<td>80</td>
</tr>
<tr>
<td>Flexibility ³, ⁴</td>
<td>ASTM D-6575</td>
<td>Maximum</td>
<td>in-lb</td>
<td>0.534</td>
</tr>
<tr>
<td>UV Resistance ³</td>
<td>ASTM D-4355</td>
<td>Minimum</td>
<td>percent</td>
<td>90 at 6,000 hrs, 85 at 10,000 hrs</td>
</tr>
</tbody>
</table>

Table Notes:
1. Minimum Average Roll Value (MARV).
2. Typical Value.
3. A smaller value for flexibility denotes a more flexible material.
4. Manufacturer to provide a certification (signed within 60 days of installation) from the ASTM D-6460 testing facility stating velocity and shear values, the duration of flow for the test, and the time frame for vegetation establishment before beginning testing.

f) The HPTRM shall be suitable for installation beneath solid slabs. Installation and anchoring shall be in accordance with Manufacturer’s requirements.

g) Provide anchor pins of sufficient length and cross section to achieve enough ground penetration to resist pullout (minimum length of 12 inches). Use longer pins or anchors for loose soils.

h) Ensure each roll of HPTRM is packaged with a material that will protect the roll from damage due to shipment, water, sunlight, and contaminants. Maintain the protective wrapping during periods of shipment and storage. Adhere to ASTM D-4873 for labeling, shipment, and storage of the HPTRM. Ensure the product labels clearly show the manufacturer’s or supplier’s name, style name, and roll number.

i) The HPTRM will be subject to sampling and testing by the Authority in accordance with ASTM D-4354 to verify conformance with these specifications. Acceptance will be in accordance with ASTM D-4759 based on testing of either conformance samples obtained using Procedure A of ASTM D-4354, or based on manufacturer’s certifications and testing of quality control samples obtained using procedure B of ASTM D-4354.

B. ARVS

Provide a soil protection system combining a HPTRM, Securing Pins, and Percussion Driven Earth Anchors (PDEA).

C. Securing Pins

Securing pins should be at least 0.20 in. diameter steel with a 1.5 in. steel washer at the head of the pin. Securing pins should be driven flush to the soil surface.

Length: 18 inches; sufficient ground penetration to resist pullout.

Placement: The pins provide for temporary tie-down of the HPTRM to the slope to aid with vegetation establishment. Locations of the pins along trenches are indicated in the drawings at the center of the 1 ft x 1 ft trench spaced 1 ft apart. Locations of the pins along the vertical overlaps are spaced 1 ft apart. HPTRM rolls wider than 10.5 ft must not have a pin spacing greater than 1.5
ft in any direction to minimize wrinkling of the material common to wide roll width geosynthetics and the loss of intimate contact beneath the HPTRM.

A securing pin sample shall be submitted to the Engineer for final approval to ensure they comply with the specified requirements.

D. Percussion Driven Earth Anchors (PDEA)

The Percussion Driven Earth Anchors shall consist of a die cast aluminum bullet nosed anchor head so that the anchor head shall not cut or break yarns. This shall minimize abrasion and installation damage to the HPTRM. Shall consist of a directionally locking, self-setting wedge grip used to lock and hold the loading applied to the anchor. Ball bearing mechanisms for load locking anchors shall not be accepted. The bullet nosed anchor head shall be attached to a zinc-aluminum coated carbon 3-foot long steel 1 x19 cable and a die cast zinc load bearing plate with openings to allow vegetative growth through the plate. The anchors shall be delivered to the jobsite fully assembled and ready for installation. All components of the anchor shall have a 50 year design life. Depth of 36 inches to provide for permanent tie down of the HPTRM to the channel or slope in the locations specified as ARVS in the drawings.

The PDEA components shall be made of materials suitable to resist corrosion and UV degradation particularly at the soil/air interface, and strategically selected to achieve an expected design life of 50 years.

The top load bearing plate shall have openings allowing vegetative growth through the plate and protrude only about 0.2 inches above the surface of the mat after installation. The plate shall also include a recessed cavity so that the cable can be cut below the plate surface.

A PDEA sample shall be submitted to the Engineer for final approval to ensure they comply with the specified requirements.

For quality control purposes and warranty claims, PDEAs shall meet the following requirements:

<table>
<thead>
<tr>
<th>PDEA MATERIAL PROPERTIES</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>Standard(s)</td>
<td>Material Composition</td>
</tr>
</tbody>
</table>
| Anchor Head (Bullet Nose)| ASTM B-85 | Aluminum A383 Alloy (Gravity Die Cast) | Width: 1.0in.  
Length: 3.3in.  
Bearing Area: 1.5in²  
Weight: 0.1 lb. |
| Cable Tendon             | ASTM A-1023 | Zinc-Aluminum Coated Carbon Steel | Diameter: 0.12 in.  
1X19 Strand Construction |
| Load Bearing Plate       | ASTM B-240-10 | Die Cast Zinc with an Eight (8) Opening Array; Utilizing a Ceramic Roller & Directional Locking Device | Diameter: 4.25 in.  
Thickness: 0.1in. |
| Tendon Sleeves           | MS51844 | Zinc-Aluminum | Length: 5/8” in  
Wall Thickness: 3/16” |

PDEA PERFORMANCE PROPERTIES
<table>
<thead>
<tr>
<th>Performance Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable Tendon Working Load Strength</td>
<td>0.8 Kips</td>
</tr>
<tr>
<td>Cable Tendon Yield Strength</td>
<td>1.1 Kips</td>
</tr>
<tr>
<td>Composite Anchor Load Strength*</td>
<td>0.5 Kips</td>
</tr>
<tr>
<td>Minimum Anchor Drive Depth</td>
<td>3.0 ft.</td>
</tr>
<tr>
<td>Maximum Anchor Drive Depth</td>
<td>5.0 ft.</td>
</tr>
</tbody>
</table>

* Anchor performance is a function of in situ soil strength and therefore the load range in this specification should be regarded as a guide only. Site specific soil conditions shall be evaluated by a licensed geotechnical engineer to determine the anchor type, depth, and pattern to resist slope instability. Pre-construction pull tests may be recommended.

227.03 EQUIPMENT – VACANT

227.04 SUBMITTALS

A. Certification

1. The Contractor shall provide the Engineer a certificate stating the name of the HPTRM AND ARVS manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.

2. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available upon request.

3. The manufacturer’s certificate shall state that the furnished HPTRM meets MARV requirements of the specification as evaluated under the manufacturer’s quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.

4. The manufacturer shall provide documented design methodology for size, length, and frequency of anchors in specific locations to meet acceptable factors of safety for critical sections of the installation. Design shall be based on designed slope geometry and geotechnical information provided by the engineer, as well as soil-specific anchor pull-out testing performed by the manufacturer.

B. The HPTRM and ARVS System shall be furnished by a single “pre-approved” manufacturer and/or supplier and not be sourced from multiple manufacturers/suppliers.

C. Manufacturing Quality Control (MQC) test results shall be provided upon request.

D. Independent Performance Test Results shall be provided upon request.

227.05 DELIVERY, STORAGE, AND HANDLING

Product labels shall clearly show the manufacturer or supplier name, style name and roll number.
Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer’s certificate.

The protective wrapping shall be maintained during periods of shipment and storage.

During storage, HPTRM shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F) and any other environmental condition that might damage the HPTRM.

227.06 QUALITY ASSURANCE SAMPLING, TESTING, AND ACCEPTANCE

Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer’s certification and testing of quality control samples obtained using Procedure B of ASTM D 4354.

Quality Assurance Sampling and Testing shall be waived for ISO 9002 Certified Manufacturing Facilities. Documentation of ISO 9002 Certification shall be provided upon request.

227.07 PRODUCTS

A. Approved Suppliers
   1. Propex Operating Company, LLC, Chattanooga, Tennessee 37422 USA, or approved equal.
      Phone (800) 621-1273 - Fax (423) 899-5005
      Joel Eisenman (913) 205-4036, joel.eisenman@propexglobal.com
   2. Contech Construction Products, Tulsa, Oklahoma 918-504-4236
   3. For pre-approval for alternate HPTRM and ARVS suppliers/manufacturers on this project, all products shall be submitted to the Engineer for review and approval no later than 10 days prior to bid date for pre-approval.

B. Alternative Suppliers
   If a system other than the Pyramat® High Performance Turf Reinforcement or ArmorMax® Anchor Reinforced Vegetation Systems are used for construction, the Contractor shall be responsible for providing an engineered solution for slope reinforcement. The following documentation shall be provided by the Contractor to support the slope reinforcement design for the alternative engineered solution:
   1. Overall ARVS Design Methodology
   2. Input Parameters
   3. Calculations / Model Output
   4. Anchor Strength
   5. Anchor Length
   6. Anchor Spacing (X-Plane) & (Y-Plane)
   7. Factor of Safety to support the slope reinforcement design

227.08 CONSTRUCTION METHODS

A. Installation
Install and maintain the high performance turf reinforcement mat in accordance with the manufacturer’s recommendations. The Engineer must approve alternate installation methods prior to execution.

The following installation details are the minimums required. The installation details noted in the drawings will control the high performance turf reinforcement mat installation.

- Ensure all longitudinal seam overlaps area minimum of 3 inches, and a maximum of 6 inches.
- Install initial trench along the crest of the slope as designated in the manufacturer’s installation drawings.
- Anchor the mat in the initial trench and roll the mat down the slope.
- Beginning at the top of the slope and working down to the toe, anchor the mat at the frequency and spacing shown in the manufacturer’s installation drawings.
- Install a longitudinal edge trench on the first and the last roll of the project.
- Install modified check slots as needed.

B. Ditch and Slope Preparation

Before installing the HPTRM, grade, shape, and finish ditch and slope surfaces so that they are stable, firm, and free of rocks or obstructions that would puncture the mat or prevent it from directly contacting the ditch and slope surface. Incorporate amendments such as lime, fertilizer, topsoil, and/or wet the soil, if needed.

C. Turf Establishment

Provide and install sod in accordance with Section 230 of the Standard Specifications.

After completing the sodding, blend the edges of the sodded areas smoothly into surrounding area. Eliminate air pockets and ensure a true and even surface. Trim frayed edges. Patch holes and missing corners.

D. Project Acceptance

Repair areas that erode prior to project acceptance at no cost to the Authority, including necessary resodding, watering, and repair of the HPTRM.

### 227.09 METHOD OF MEASUREMENT

The Engineer will measure the area covered by the HPTRM installed in place, not including overlaps between adjacent pieces of mat. Standard HPTRM steel pins (0.2”) up to 24 inches long with 1.5” diameter steel washer shall be incidental to the HPTRM installation.

### 227.10 BASIS OF PAYMENT

Work performed and materials furnished and accepted will be paid for at the contract unit price for:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH PERFORMANCE TURF REINFORCEMENT MAT</td>
<td>Square Yard [Square Meter]</td>
</tr>
<tr>
<td>ANCHORED REINFORCED VEGETATION SYSTEM</td>
<td>Square Yard</td>
</tr>
</tbody>
</table>

The Authority will consider the cost of mat fasteners, preparation of the soil base for mat, pinning the HPTRM and construction anchor trenches in the contract unit price of High Performance Turf Reinforcement Mat or Anchored Reinforced Vegetation System.

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NOT FOR CONSTRUCTION

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OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION FOR
SECTION 317
CEMENT TREATED BASE
CONTRACT NO. EOC-2465


(Replace with the following:)

317.1 DESCRIPTION

This work consists of constructing a cement treated base (CTB) using a soil, aggregate, and cement mixture.

317.2 MATERIALS

Provide material in accordance with the following subsections:

<table>
<thead>
<tr>
<th>Material</th>
<th>Subsection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland Cement</td>
<td>701.02</td>
</tr>
<tr>
<td>Water</td>
<td>701.04</td>
</tr>
<tr>
<td>Fly Ash</td>
<td>702.01</td>
</tr>
<tr>
<td>Curing Agents</td>
<td>701.07.C</td>
</tr>
<tr>
<td>Aggregates</td>
<td>703.02</td>
</tr>
</tbody>
</table>

Provide aggregates that conform to the requirements of Subsection 703.02, except ensure that the aggregate has an Aggregate Durability Index of at least 30, tested in accordance with AASHTO T 210.

Provide separator fabric in accordance with Section 712.05, “Geotextiles for Bases,” except ensure the fabric meets the requirements of AASHTO M288, Class 1 and weighs at least 15 oz/yd² [500 g/m²].

317.3 EQUIPMENT

Use equipment for producing and placing the CTB in accordance with Subsection 301.03, “Equipment,” except only use stationary plants and equipment that combines placement and initial compaction.
317.4 CONSTRUCTION METHODS

A. Mix Design and Proportioning

Design CTB mixtures in accordance with OHD L-53. Ensure Portland cement is at least 75% of the total cementitious materials in the mix. Submit a CTB mix design to the Engineer at least seven (7) days prior to the beginning of paving.

At a minimum, include the following information with each CTB mix design:

• Project identification
• Name and address of the Contractor and producer
• A unique mix design name
• Aggregate sources
• Gradations for each aggregate source. Sieve sizes shall include the 1 ½ in [37.5 mm], 1 in [25 mm], ½ in [12.5 mm], No. 4 [4.75 mm], No. 40 [150 µm], and the No. 200 [75 µm]
• Hydraulic cement type and source
• Types of cement replacement, if used, and sources
• Types of admixtures and sources, if used
• Material proportions
• Combined gradation charts
• Unit weight
• Compressive strength at 7 days

B. Mixing

Handle and measure materials, batching, and mixing in accordance with Subsection 414.04.C, “Mixing Concrete,” except only use a central mix plant which has been approved by the Engineer.

C. Placement

Before spreading the CTB, moisten the surface of the compacted subgrade unless the subgrade has been primed. Finish and compact the CTB to produce a smooth, dense surface that is free of surface compaction planes, cracks, ridges, or loose material.

Compact the CTB within two (2) hours of adding water to the aggregate and cement. Follow the recommendations of the mix design. Compact the CTB to at least 95% of the maximum density and test in accordance with OHD L-54. Place the CTB in a single layer. Ensure the compacted thickness is in accordance with the dimensions shown on the plans and in compliance with Subsection 301.04.A, “Tolerances.” After strike off and consolidation, finish the CTB to meet the required elevation and cross section, and to create a smooth surface. Use equipment that automatically controls both grade and line to trim the surface of the CTB.

Keep the CTB surface moist during finishing operations, and until the application of the curing agent. Apply a curing agent on the finished CTB surface at the rate of at least 1 gal per 150 ft² [2 L per 7 m²].
Use butt or sawed longitudinal construction joints; those between the driving lanes shall match the longitudinal joint of overlying pavement. Place other longitudinal joints within 3 ft [1 m] of the longitudinal joint of the overlying pavement and construct transverse joints as butt joints. Before placing the separator fabric, sweep the CTB surface. Place and secure the separator fabric onto the surface of the CTB in such a manner that the fabric remains free of wrinkles and cracks. Secure the separator fabric with asphalt binder, mechanical fasteners, or other method approved by the Engineer. Overlap the fabric 8 in [20 cm] both longitudinally and transversely.

Limit construction traffic on the CTB to that necessary to apply the separator fabric and overlying pavement. Do not use the CTB layer as a haul road. Allow only concrete delivery trucks necessary to deposit fresh concrete directly in front of the paver. Place overlying pavement on the base after compressive strengths reach at least 600 psi [4,150 kPa] in accordance with OHD L-54. Repair damage to the CTB at no additional cost to the Authority.

D. Weather Limitations

Do not mix CTB if the aggregate or subgrade is frozen. Mix and place CTB when the ambient air temperature is at least 40 °F [5 °C] and rising. Protect CTB from freezing for seven (7) days after placement.

E. Tolerances

Finish the CTB in accordance with Subsection 301.04.A, “Tolerances.”

F. Acceptance

The Engineer will base pay adjustments for strength on a lot by lot basis. A lot will normally be defined as 10,000 yd² [10,000 m²] (four sublots of 2,500 yd² [2,500 m²] each).

The Contractor will be responsible for making test cylinders and determining compressive strength of the CTB in accordance with OHD L-54. At least one cylinder will be made for testing from a random location in each sublot in accordance with OHD L-54. Strength of plant mix CTB shall be between 600 psi [4,150 kPa] and 2,000 psi [13,800 kPa].

The Engineer is responsible for performing compaction tests during placement of the CTB using a nuclear density gauge in accordance with OHD L-54. At least one (1) test will be performed from a random location in each subplot in accordance with OHD L-54.

The Engineer will reject any load of mixture that is visually unacceptable for reasons of being too wet, excessively segregated, or otherwise obviously deficient.

Replace rejected CTB at no additional cost to the Authority. When replacing rejected CTB, remove a width of at least one lane and a length of at least 15 ft [4.5 m]. If the removal is within 15 ft [4.5 m] of any transverse joint, remove to the joint.
317.5 METHOD OF MEASUREMENT

The Engineer will measure the surface area of the completed Cement Treated Base placed at the thickness shown on the Plans.

317.6 BASIS OF PAYMENT

The Authority will pay for each pay item at the contract unit price per the specified pay unit as follows:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENT TREATED BASE</td>
<td>Square Yard [Square Meter]</td>
</tr>
</tbody>
</table>

The Authority will consider the cost of separator fabric and method of fastening to be included in the contract unit price for Cement Treated Base.

The Authority will utilize Table 317:1 to calculate the strength pay factor for CTB extents with strengths less than or greater than the specified requirements:

<table>
<thead>
<tr>
<th>Strength</th>
<th>Pay Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 600 psi</td>
<td>Remove &amp; Replace</td>
</tr>
<tr>
<td>600 psi - 2,000 psi</td>
<td>1.00</td>
</tr>
<tr>
<td>2,000 psi - 4,000 psi</td>
<td>1.00 - (((Actual Strength - 2,000) ÷ 2,000)²)</td>
</tr>
<tr>
<td>&gt; 4,000 psi</td>
<td>Remove &amp; Replace</td>
</tr>
</tbody>
</table>

Multiply the contract price by the Strength Pay Factor for the represented CTB extent. Check any outlying concrete cylinder strengths in accordance with ASTM E 178 Table 1, “Upper 10% Significance Level.”

(Add the following):

411.01 DESCRIPTION

Warm Mix Asphalt (WMA) is defined as an asphalt binder and aggregate mixture which, by additive or process, can be produced and placed at a reduced temperature than normal Hot Mix Asphalt (HMA) temperatures. WMA requirements are the same as for HMA except where noted.

411.04 CONSTRUCTION METHODS

K. Compaction

(1) General

Ensure that the WMA immediately behind the paver is at least 215°F [102°C].
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 411
COMPACCTION OF HOT MIX ASPHALT
EOC-2465


(Revise as follows:)

411.04 CONSTRUCTION METHODS

K. Compaction

(2) Acceptance

(a) Layers At Least 1½ in [38 mm] Thick (Replace the first paragraph with the following:)

Ensure the target density of each lot is 94 percent of the Maximum Theoretical Density, determined by the specific gravity of the HMA in accordance with AASHTO T 209.

(Replace Table 411:2 with the following:)

<table>
<thead>
<tr>
<th>Pay Adjustment Factor (PAF) a % of Maximum Theoretical Density</th>
<th>Average Lot Density (ALD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 97.0</td>
<td>Unacceptable b</td>
</tr>
<tr>
<td>92.0 – 97.0</td>
<td>1.00</td>
</tr>
<tr>
<td>91.0 – 91.9</td>
<td>1.00 – (0.07)(92.0 – ALD)</td>
</tr>
<tr>
<td>88.1 – 90.9</td>
<td>0.93 – (0.15)(91.0 – ALD)</td>
</tr>
<tr>
<td>&lt; 88.1</td>
<td>Unacceptable b</td>
</tr>
</tbody>
</table>

a Use PAF for Roadway Density in the Combined Pay Factor equation in accordance with Subsection 411.04.N.(2).(a), “Basis of Acceptance and Payment.”

b Unless otherwise directed by the Engineer, remove and replace unacceptable lots at no additional cost to the Authority.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 411
LONGITUDINAL JOINT DENSITY ON ASPHALT CONCRETE
PAVEMENT
EOC-2465


411.04 CONSTRUCTION METHODS

J. Joints (Add the following:)

(1) Longitudinal Joint Density

For each lot, or sublot at locations where roadway density tests are to be taken, perform a joint density evaluation at each pavement edge that is or will become a longitudinal joint. Determine the joint density in accordance with OHD L-14, Appendix B. The joint density is considered failing if the density at the joint is more than 3.0 pcf below the density at the random sample location at the same station and the measured (by core or correlation) joint density is less than 90%.

Investigate joint density failures and take corrective actions during production and placement to improve the joint density. Suspend production if two (2) consecutive evaluations fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.
These Special Provisions revise, amend, and where in conflict, supersede applicable Sections of the

(Replace Section 504.04(I), “Rails, Parapets, and Curbs” with the following:)

I. Rails, Parapets, and Curbs

For concrete rails, parapets, and curbs, comply with Sections 509 and 511. For cast-in-place
superstructures, such as, slab spans, pan girders, and post tensioned spans, do not place railing, parapets, and
curbs until the falsework for the span has been released and the span swung.

(1) Method of placement for cast-in-place methods comply with Section 502. For slip form methods
comply with Section 502 and the following:

(a) Submit specifications on equipment to be used including the following:

- Identify rates of placement
- Cover needed over reinforcement for the equipment
- Proper vibration frequency and amplitude
- Clearance to edge of deck
- Concrete slump limitations

(b) Submit plans in accordance with section 105.02 for any details that must change to
accommodate slip form equipment or processes.

(c) Conduct pre-placement conference and dry run in the presence of the Engineer. Check
equipment operation, reinforcement stiffness, reinforcement, and preformed joint clearance for
the entire length of rail to be placed. Do not start placement until the Engineer approves dry run.

(d) Assure that all placement rates, reinforcement cover, vibration frequency and amplitude, and
concrete slump are maintained throughout the placement. Make sure preformed joints remain
vertical during slip form operation. Saw cut joints within four hours of placement. Stop
placement and address any deficiencies that may cause lack of cover over reinforcement,
reinforcement cage to move, concrete to honeycomb, joint movement, or rail misalignment.

(e) Take a minimum of three 2 inch (50 mm) diameter cores per 100 feet (30 m) of rail or parapet.
Each core must penetrate at least ¾ of the thickness of the rail or parapet, and at least one of the
3 cores must be in the bottom 1/4 of the rail or parapet height. Equally distribute the three cores
along the length of each placement. Separate parapets or rails placed on the same date shall be
considered separate placements. Cores will not be measured for payment.
(f) The Engineer will mark additional locations for cores where, in the sole opinion of the Engineer, the quality of the slip formed rail or parapet is suspect. Any cores taken from parapet sections where the quality is suspect that are later shown to be sound, free of defects, and accepted will be paid for according to Section 109.04.

(g) Any cores showing voids of any size adjacent to the reinforcement bars, or voids not adjacent to reinforcement bars of 1/4 square inch (160 square millimeters) in area or more, or showing signs of segregation or cracking shall be considered failures and the rail or parapet section from which it was taken will be rejected. A rail or parapet section shall be defined as the length represented by the cores.

(f) Remove the entire section of rejected rail or take additional cores at a maximum of 10 foot intervals at no additional payment to determine the longitudinal extent of removal and replacement. After additional coring, the minimum length of rail or parapet removal and replacement will be 3 feet (1 m). Remove and replace any rail or parapet section in its entirety with more than one half of its length rejected. Remove segments less than 10 feet (3m) long from failed areas to expansion joints or the end of rail.

(h) Replace damaged reinforcement and ensure minimum splice length by performing additional concrete removal if necessary. Repair damage to epoxy coating in accordance with Section 511.04.

(i) Fill all core holes with a non-shrink grout meeting the requirements of Section 509.04(h). Grouting will not be measured for payment.

507.02 BEARING ASSEMBLIES (Replace with the following:)

A. General

Provide materials in accordance with the following section and subsections:

<table>
<thead>
<tr>
<th>Material:</th>
<th>Section or Subsection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welding of Weathering Steel</td>
<td>724.03</td>
</tr>
<tr>
<td>Stainless Steel Bearing Assemblies</td>
<td>724.05.A</td>
</tr>
<tr>
<td>Welding of Stainless Steel</td>
<td>724.05.A</td>
</tr>
<tr>
<td>Weathering Steel Bearing Assemblies</td>
<td>724.05.B</td>
</tr>
<tr>
<td>Elastomeric Bearing Pads</td>
<td>733.06</td>
</tr>
</tbody>
</table>

B. Steel Laminates

Provide steel laminates in accordance with AASHTO M 270 Grade 36 or ASTM A 1011 Grade 40.

C. Stainless Steel

Provide stainless steel for Stainless Steel Bearing Assemblies in accordance with Subsection 724.05.A, “Stainless Steel Bearing Assemblies,” for bearing plates and bearing assemblies, including anchor bolts, nuts, washers, contact plates, and contact angles.

D. Weathering Steel

Provide weathering steel for Weathering Steel Bearing Assemblies in accordance with Subsection 724.05.B, “Weathering Steel Bearing Assemblies,” for bearing plates and bearing assemblies, including anchor bolts, nuts, washers, contact plates, and contact angles.
507.06 BASIS OF PAYMENT *(Replace with the following)*

The Authority will pay for each pay item at the contract unit price per the specified pay unit as follows:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(A) STAINLESS STEEL FIXED BEARING ASSEMBLY</em></td>
<td>Each</td>
</tr>
<tr>
<td><em>(A) WEATHERING STEEL FIXED BEARING ASSEMBLY</em></td>
<td>Each</td>
</tr>
<tr>
<td><em>(B) STAINLESS STEEL EXPANSION BEARING ASSEMBLY</em></td>
<td>Each</td>
</tr>
<tr>
<td><em>(B) WEATHERING STEEL EXPANSION BEARING ASSEMBLY</em></td>
<td>Each</td>
</tr>
<tr>
<td><em>(C) ELASTOMERIC BEARING PADS</em></td>
<td>Each</td>
</tr>
</tbody>
</table>

The Authority considers the cost of anchor bolts, bearing plates, contact plates, nuts, contact angles, plain or laminated elastomeric bearing pads, and welding to be included in the contract unit price for *Fixed Bearing Assemblies and Expansion Bearing Assemblies*. 
This item covers the requirements for the application of Surface Concrete Finish, CIM 1000, to the surfaces of the abutments and piers according to the notes and details shown on the plans, the requirements of the applicable Sections of the Standard Specifications and this Special Provision.

The Special Concrete Finish shall be a liquid applied urethane coating, CIM 1000 (Commercial Industrial Membrane), as manufactured by CIM Industries, Inc. or an approved equal. Materials and product information can be obtained from Laster Castor Corp. of Tulsa, Oklahoma, phone number 918-234-7777.

The equipment and methods of applying the urethane coating (CIM 1000) shall be in accordance with the product coating profile and instruction guides for application to concrete. Precautionary measures shall be in accordance with the Material Safety Data Sheets as provided by CIM Industries, Inc.

The coating shall be 60 mils dry thickness and 68 mils wet thickness. In addition to applying the coating to the concrete substructure units as shown in the plans, the coating shall return up the vertical surfaces of the pier and abutment bearing pads to provide a water tight seal with the concrete pedestals. The returns should only extend the height of the pads. Surface preparations and product mixing shall be per the manufacturer’s recommendations and all new concrete shall have a minimum strength of 3000 psi at the time of application. Primer shall be applied to the concrete surfaces prior to applying the coating. All concrete work shall be completed prior to the application of the Special Concrete Finish.

Water repellent will not be required on surfaces that are coated with CIM 1000.

Pay Item: 509 (PL) SPECIAL CONCRETE FINISH
Pay Unit: SQ. YD.

Such payment shall be full compensation for furnishing all materials, equipment, labor and incidentals necessary to supply and install the item, complete-in-place.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 516
DRILLED SHAFT FOUNDATIONS
EOC-2465


(Replace with the Following:)

516.01 DESCRIPTION

This work consists of constructing drilled shafts and providing and placing reinforcing steel, concrete and procedures for integrity testing of drilled shafts, including remedial actions.

516.02 MATERIALS

A. General

Use materials in accordance with the following sections:

<table>
<thead>
<tr>
<th>Material:</th>
<th>Section:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Concrete</td>
<td>509</td>
</tr>
<tr>
<td>Reinforcing Steel for Structures</td>
<td>511</td>
</tr>
</tbody>
</table>

B. Concrete

Provide and modify Class AA concrete as follows:

- Limit the maximum aggregate size to ¾ in [19 mm],
- Ensure that water-cement ratio is 0.44 or lower,
- Use a high range water reducing admixture to achieve 6 in to 8 in [150 mm to 200 mm] of slump at the placement start. Ensure at least 4 in [100 mm] of slump exists at the completion of placement and casing or reinforcement alignment,
- Maintain the concrete temperature below 85 °F [30 °C] during placement.
- For concrete placed under water or slurry, use cementitious material such as slag or fly ash (not cement) to increase the minimum cementitious content 10%, and
- Submit optional anti-washout additives to the Engineer for approval.

C. Casings

For exterior casings, provide smooth, clean, watertight, steel casings that can withstand handling, driving, driving stresses, and pressures from the concrete and surrounding earth. Provide permanent casing with the dimensions specified by the American Pipe Institute.
tolerances for regular steel pipe. If only a single casing is used in a shaft, the casing is considered an exterior casing.

For permanent exterior casings, use steel in accordance with AASHTO M 270 Grade 36 (ASTM A709M Grade 250), unless otherwise specified by the Contract. Weld permanent exterior casings in accordance with Section 506, “Structural Steel.” The Authority defines permanent exterior casing diameters shown on the Plans as outside diameters.

When the Contract requires permanent exterior casings, or if the contractor elects to provide a permanent exterior casing, ensure that a Registered Professional Engineer in the State of Oklahoma stamps and designs the design and calculations for these casings. Submit permanent casings and design calculations to the Engineer. Provide casing thicknesses not less than Shown in Table 516:1.

<table>
<thead>
<tr>
<th>Table 516:1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Permanent Casing Wall Thickness</td>
</tr>
<tr>
<td>&lt;48” [&lt;1220 mm]</td>
</tr>
<tr>
<td>0.375”[10 mm]</td>
</tr>
<tr>
<td>48”-78” [1220 mm – 1980 mm]</td>
</tr>
<tr>
<td>0.500”[13 mm]</td>
</tr>
<tr>
<td>&gt;78” [&lt;1980 mm]</td>
</tr>
<tr>
<td>0.625”[16 mm]</td>
</tr>
</tbody>
</table>

For permanent interior casings, use round corrugated galvanized steel pipe with 3 in × 1 in [75 mm × 25 mm] corrugations in accordance with AASHTO M 36. Ensure the pipe gauge stays round and can withstand the concrete pressure.

**516.04 CONSTRUCTION METHODS**

**A. Plan for Drilled Shaft Installation**

Use personnel experienced in constructing drilled shafts.

Submit an installation plan or work plan for approval to the Engineer that includes the following details before constructing drilled shafts:

- List of personnel experienced in constructing drilled shafts including resumes of project experiences and documentation that verifies the information;
- Concrete mix design including results of concrete trial mix and tests for slump loss over time. Include procedures for introducing admixtures during mixing operations including set retarders;
- List of proposed equipment to be used, including cranes, drills, augers, bailing buckets, final cleaning equipment slurry pumps, core sampling equipment, tremies, and concrete pumps;
• List types of casings to be used by the contractor in accordance with Subsection 516.02.C, “Casings.” Include diameters and thicknesses for all permanent, temporary, and surface casings;
• Details of shaft excavation methods and procedures for maintaining horizontal and vertical alignment of the excavation;
• When the slurry method is used, include details of the methods to mix, circulate, desand, and dispose of the slurry;
• Details of methods to clean the shaft excavation, including the method to clean the bottom of the hole;
• Use or disposal of the excavated materials;
• Placement of reinforcing steel including support and centering methods required to minimize lateral movement of the steel cage including bolsters and the type of spacers: plastic rollers, concrete rollers, or sleds (when permitted). Provide any required material documentation for bolsters and spacers;
• Concrete placement, including proposed operational procedures for tremie and pumping methods. Include procedure that will be used to verify the outlet end is at least 10 ft (3 m) into the fluid concrete.
• Type and method of shaft inspection devices (SID) to be used; and
• The format of the video that will be provided to the Engineer, and method of delivery.

Revise and resubmit the installation plan if it does not produce Contract required results. Submit requests for changing the top of shaft elevations with the installation plan.

B. Trial Drilled Shafts

If the Contract requires trial drilled shafts, construct them adjacent to the permanent shafts before constructing the permanent drilled shafts. Demonstrate that the methods and equipment can construct the Contract required drilled shafts. Include reinforcement and CSL tubes for the most heavily reinforced drilled shafts as noted in the plans.

Construct the trial shaft to the size and tip elevation of the deepest shaft shown on the Plans. To monitor excavation stability and groundwater seepage, leave completed excavation open for at least 4 hours before placement of concrete. Clean the excavation and fill the hole completely with mix design concrete. Remove the concrete 2 ft [0.6 m] below the finished grade. Perform all nondestructive testing including CSL testing as shown on the plans or as directed by the Engineer.

If the Engineer determines that trial drilled shaft is unsatisfactory based on results of CSL other nondestructive testing, and/or coring, modify and resubmit the installation plan and drill a new trial shaft. The Engineer will not allow changes to the installation plan without resubmission.
C. Drilled Shafts

(1) Hole Excavation

Excavate holes in accordance with the installation plan. Before drilling, excavate for structure footings supported on drilled shafts and construct embankments and fills.

Place the drilled shaft horizontally at the top of the shaft elevation within 3 in [75 mm] of the position shown on the Plans. Ensure the vertical shaft alignment does not vary by more than 1 percent of shaft depth.

Use excavation equipment and methods that provide a shaft bottom normal to the axis of the shaft within 5 percent of the shaft diameter. Measurement of the shaft bottom tolerance will be left to the discretion of the Engineer. Use excavation equipment that provides a drilled shaft diameter larger than or equal to the plan diameter minus 1 in [25 mm].

Excavate below the elevation shown on the Plans if the load bearing material does not satisfy Plan requirements. Take soil samples or rock cores as shown on the Plans to determine the character of the material directly below the shaft excavation. Immediately notify the Engineer of deviations in subsurface conditions that may change the shaft depth.

Check dimensions and alignment of shaft excavations in the presence of the Engineer. The Engineer will measure final shaft depth after final cleaning. If the sidewall of the hole softens due to excavation methods, swells due to delays in concreting, or degrades due to slurry cake buildup, over-ream the sidewall from ½ in to 3 in [12 mm to 75 mm] to sound material. When a shaft constructed using the mineral slurry technique sets more than 4 hours without agitation, ream the shaft to remove the cake build up.

Immediately before placing the reinforcing steel cage or concrete, clean the hole so 50 percent of each hole bottom has less than ½ in [12 mm] of sediment. Ensure the remaining 50 percent of the hole has no greater than 1½ in [38 mm] of sediment or debris. For dry holes, reduce the water depth to 6 in [150 mm] or less before placing concrete.

Verify that the shaft bottom has been adequately cleaned using a Shaft Inspection Device (SID). Use SID’s with a high-resolution camera mounted in a watertight chamber and fitted with a depth gauge(s) to indicate the thickness of the debris on the shaft bottom. Furnish all equipment necessary to conduct the SID inspection. Provide nitrogen gas or other means to pump the water out of the interior of the chamber such that the bottom of the shaft is visible. Do a minimum of five (5) drops as follows: north, south, east, west, and center (see Attachment 516:1). Operate the SID camera and supporting equipment under the direction of the Engineer in such a manner as to obtain optimum clarity from the equipment. Use television cameras and lighting equipment capable of operating in dry or submerged conditions encountered during the inspection. Record the observations for the shaft bottom on a DVD or flash drive in.mov, .avi or other acceptable electronic format specified by the Engineer to become the property of the Authority upon completion of the project. Store DVD’s or flash drives in proper containers with dust tight closures. Label DVD’s or flash drives as to shaft number, project number, contract number, and contractor name. Furnish DVD’s or flash drives to the Engineer upon completion of the SID inspection. Continue cleaning until the Engineer is satisfied that the hole bottom is adequately cleaned and the excavation is approved.
Use at least one of the following methods for excavation:

(a) **Dry Method**

Use the dry construction method at sites where the Engineer can visually inspect the shaft before concrete placement. For the dry method:

- Drill the shaft,
- Remove accumulated water,
- Remove loose material from the excavation,
- Place the reinforcing cage, and
- Concrete the shaft in dry conditions.

If caving, sloughing, or swelling conditions exist or if depth or groundwater seepage exceeds 6 in [150 mm] within one-half hour after pumping is stopped, discontinue the dry construction method and use an alternative method approved by the Engineer.

(b) **Wet Method**

Use the wet construction method or a casing construction method for shafts that do not meet the requirements for dry construction. For the wet method, use water or slurry with the proper hydraulic head to maintain the stability of the hole while advancing the excavation to final depth, placing the reinforcing cage, and concreting the shaft. The wet method involves the following work:

- De-sanding and cleaning the slurry,
- Final cleaning of the excavation,
- Placing the shaft concrete with a watertight tremie or pumping concrete into a watertight tremie beginning at the shaft bottom,
- Providing temporary surface casings to aid shaft alignment and positioning, and
- Providing temporary surface casings to prevent sloughing of the top of the shaft excavation.

Refer to Subsection 516.04.C.(2) “Slurry,” for slurry requirements.

(c) **Casing Methods**

1) **General**

The Authority will not allow casing to the bottom of the shaft. Discontinue the casing at the top of the founding stratum as shown on the Plans. Excavate below the casing using the dry or wet method. To provide design frictional load capacity, excavate into the founding stratum to the deepest length or depth shown on the Plans. Install casing in accordance with Subsection 516.04.C.3, “Exterior Casings.” Do not use the double casing method when a rock socket is not present.

2) **Temporary Casing Method**

If unable to use the dry or wet methods, use the temporary casing construction method. For temporary casing:

- Use the wet method to advance the excavation through caving material into an impervious formation and set the temporary casing or use a vibratory
hammer to drive the casing into the impervious formation prior to excavation,
- Complete excavation and seat the casing into rock by twisting the casing,
- Place the reinforcing cage, and
- Concrete the shaft while removing the casing.

3) **Permanent Casing Method**

Use the permanent casing construction method if shown on the Plans or where drilled shafts are in open water. For the permanent casing method, advance the excavation through caving material by driving or drilling a permanent casing to the Contract required depth or into a nearly impervious formation, whichever is deepest. Excavate to final depth, or into a nearly imperious formation, whichever is deepest. Place the reinforcing cage, and concrete the shaft. If full penetration cannot be attained during casing installation, excavate within the embedded portion of the casing. Drill a pilot hole if necessary. Ensure continuous casing from the top of the shaft to the elevation shown on the Plans. If the drilled shafts are in open water, extend casings from above the water elevation into the ground to protect the shaft concrete from the water during concrete placement and curing.

4) **Double Casing Method**

Use the double casing construction method if the Contract requires or, as an alternative for the temporary casing method, in the presence of severe groundwater or unstable soil conditions. Make the temporary exterior casing larger than the Contract required shaft diameter and set a permanent interior casing into the top of the founding stratum after excavation completion.

Supply the interior casing with a permanent inner diameter equal to the shaft diameter shown on the Plans. Use a temporary exterior casing with an inner diameter at least 6 in [150 mm] larger than the interior casing, but not more than 12 in [300 mm] larger. After placing the exterior casing, complete the excavation as shown on the Plans. Set the interior casing into the top of the founding stratum and brace it at the top. Remove the temporary casing after filling the interior casing with concrete. Add concrete to maintain top of shaft elevation during removal. After the concrete initially sets, do not adjust the interior casing position.

(d) **Obstructions**

The Authority defines an obstruction as unexpected manmade materials through which excavation cannot advance. The Authority does not consider removal of tools lost in the excavation, obstructions. Removal of naturally-occurring material, regardless of difficulty or removal method, is not considered an obstruction.

Remove obstructions encountered during excavation. Notify the Engineer, in advance, of the proposed obstruction removal method. Include a cost estimate for excess costs in accordance with Subsection 104.03, “Differing Site Conditions,” for obstruction removal compensation.
(2) Slurry

Before introducing it into the shaft, hydrate the slurry by premixing the material with fresh water in accordance with the slurry manufacturer’s instructions. Provide slurry tanks with the capacity for slurry circulation, storage, and treatment. The Authority will not allow the use of excavated slurry pits. Use either mineral (bentonite or attapulgite) or polymer slurry.

Provide de-sanding equipment to limit slurry sand content at any point in the bore hole. Ensure slurry sand content is less than 4 percent by volume for mineral slurry and less than 1 percent for polymer slurry. The Engineer does not require de-sanding to set temporary casings.

During drilling, maintain a slurry surface in the shaft at least 5 ft [1.5 m] above the highest expected water table elevation or piezometric head and at a level that prevents the hole from caving.

When there is a sudden loss of slurry from the hole, stop drilling and take corrective action to prevent slurry loss. If the slurry construction method fails to produce the Contract required results, stop and use an alternative method approved by the Engineer.

When the excavation reaches the elevation shown on the Plans and clean, allow at least 30 min for polymer slurry to stand undisturbed. Clean the excavation base with a submersible pump or air lift.

Maintain the density, viscosity, and pH of the slurry during shaft excavation in accordance with Table 516:2, “Acceptable Range of Mineral Slurry” for mineral slurry and Table 516:3, “Acceptable Range of Polymer Slurry” for polymer slurry.

<table>
<thead>
<tr>
<th>Property, Method</th>
<th>At the time of slurry introduction</th>
<th>In hole at time of concreting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, a Density Balance (lb/ft³ [kg/m³])</td>
<td>64.3 – 69.1 [1,030 – 1,107]</td>
<td>64.3 – 75.0 [1,030 – 1,200]</td>
</tr>
<tr>
<td>Viscosity, Marsh Cone (s/ qt [s/L])</td>
<td>28 – 45</td>
<td>28 – 45</td>
</tr>
<tr>
<td>pH, pH paper or meter</td>
<td>8 – 11</td>
<td>8 – 11</td>
</tr>
</tbody>
</table>

Note: Perform tests when slurry temperatures are above 40 °F [4 °C].

a Density values are for fresh water. Increase density values 2.0 lb/ft³ [32 kg/m³] for salt water.

Table 516:3
Acceptable Range of Polymer Slurry

<table>
<thead>
<tr>
<th>Property, Method</th>
<th>At the time of slurry introduction</th>
<th>In hole at time of concreting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, a Density Balance (lb/ft³ [kg/m³])</td>
<td>64.3 – 75.0 [1,030 – 1,200]</td>
<td>64.3 – 75.0 [1,030 – 1,200]</td>
</tr>
<tr>
<td>Viscosity, Marsh Cone (s/ qt [s/L])</td>
<td>28 – 45</td>
<td>28 – 45</td>
</tr>
<tr>
<td>pH, pH paper or meter</td>
<td>8 – 11</td>
<td>8 – 11</td>
</tr>
</tbody>
</table>

Note: Perform tests when slurry temperatures are above 40 °F [4 °C].

a Density values are for fresh water. Increase density values 2.0 lb/ft³ [32 kg/m³] for salt water.
Table 516:3
Acceptable Range of Polymer Slurry

<table>
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<tr>
<th>Property, Method</th>
<th>At the time of slurry introduction</th>
<th>In hole at time of concreting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, a Density Balance (lb/ft³ [kg/m³])</td>
<td>62.4 – 63.0 [1,000 – 1,010]</td>
<td>62.4 – 63.5</td>
</tr>
<tr>
<td>Viscosity, Marsh Cone (s/qt [s/L])</td>
<td>30 – 40 [32 – 42]</td>
<td>30 – 40</td>
</tr>
<tr>
<td>pH, pH paper or meter</td>
<td>9 – 11</td>
<td>9 – 11</td>
</tr>
</tbody>
</table>

Note: Perform tests when slurry temperatures are above 40 °F [4 °C].

a Density values are for fresh water. Increase density values 2.0 lb/ft³ [32 kg/m³] for salt water.

Take slurry samples using an Engineer approved sampling tool. Extract slurry samples from the base of the shaft and from 10 ft [3 m] above the shaft base. Perform four sets of tests during the first 8 hr of slurry use. When the results are acceptable and consistent, perform one test set for every 4 hr of slurry use.

Make corrections if the test results indicate unacceptable slurry samples. Place concrete when the resampling and retesting indicate acceptable values.

Provide test report to the Engineer, signed by an authorized technical representative, after completion of each drilled shaft.

Dispose of slurry at approved locations.

(3) Exterior Casings

Ensure casings produce a positive seal that prevents water or other material from piping into or out of the hole. If substituting a casing with a longer or larger diameter casing through caving soils, stabilize the excavation with slurry or backfill before installing the new casing.

Consider subsurface exterior casings as temporary unless designated in the Contract as permanent casing. Remove temporary casing before completing placement of concrete in cased drilled shaft. While removing casing from the hole, maintain at least 5 ft [1.5 m] of fresh concrete in the casing above the surrounding level of water or slurry. Ensure the excess concrete within the casing displaced fluid trapped behind the casing upward and discharges it at the ground surface without contaminating or displacing the shaft concrete.

The Authority defines defects in the drilled shaft as temporary casings that are bound or fouled during shaft construction and cannot be practically removed, as determined by the Engineer.

Extend casings above the surface to keep the excavation clean through concrete placement. Cut the casing off of permanent casings at the elevation shown on the Plans and leave in place after concrete placement.
(4) Reinforcing Steel Cages for Drilled Shafts

(a) General

When tying the drilled shaft cage, support the reinforcing steel off the ground. Protect epoxy coated reinforcing steel from exposure to the sun and ensure that the surface of the bars is free of excessive rust, soil, oil and as specified in Subsection 511.04. Place the reinforcing steel cage as a unit only after the shaft excavation is approved by the Engineer and before concrete placement. Tie reinforcing steel lap splices together using wire.

Tie and support the reinforcing steel to keep it within the contract required tolerances. Tie spacing devices at least at fifth points around the cage perimeter or one per 12 in [300 mm] of shaft diameter. Provide spacers at intervals no greater than 10 ft [3 m] along the length of the cage. Place spacers within 18 in [450 mm] of the top and bottom of the shaft. Use concrete spacers that equal the shaft concrete in quality and durability. Concrete sleds are acceptable in lieu of the rollers but only when casing is used down to the rock line.

Alternate reinforced or non-reinforced virgin plastic spacers may be used provided the plastic spacers meet the following requirements:

- Use spacers of adequate strength to withstand a 300 lb [1,335 N] concentrated load without permanent deformation or breakage.
- Limit deformation under 300 lb [1,335 N] load to a maximum of 5% of the support height.
- Use spacers able to meet the concentrated load requirement within a working temperature range of 20 to 150°F [-7 to 65°C], and have a maximum water absorption rate of 5% as per ASTM D 570.
- Provide reinforced or non-reinforced virgin plastic when tested in accordance with ASTM D 695 having a compressive strength greater than 4,000 psi at 1% deformation based on a 2”x2”x2” cubic test specimen.

Protect plastic spacers from exposure to sunlight until placed in the reinforcing steel cage. Remove and replace any broken, cracked or damaged spacers.

Temporarily strengthen the reinforcing steel cage to resist the lifting forces when the cage is lifted from a horizontal position to a vertical position. Use multiple pick-up points, strongbacks, slings or other means to support the reinforcing cage while it is being lifted. If there is evidence of excessive bending of the steel cage and/or if slippage of the spiral or tie bars occurs, repair or replace the reinforcing steel cage as needed.

During concrete placement, provide positive support from the top for the reinforcing steel cage. Support the cage concentrically to prevent racking and distortion. Maintain the top of the reinforcing steel cage no greater than 6 in [150 mm] above and no greater than 3 in [75 mm] below the Contract required position. Make corrections if the reinforcing steel cage is not maintained in that position. Do not construct additional shafts until the method of reinforcing steel cage support has been approved by the Engineer.
Engineer. Alternately, support the bottom of the reinforcing steel cage using footing attachments consisting of concrete, mortar, or plastic bolsters as approved by the Engineer. Use bolsters capable of supporting a 1,000 pound [4,450 N] load without breakage. Do not use bolsters which will extend above the bottom of the reinforcing steel as it may interfere with the CSL testing.

Provide additional reinforcing steel if conditions require shafts longer than shown on the Plans.

(b) Access Tubes for Crosshole Sonic Logging

Provide Crosshole Sonic Logging (CSL) testing access tubes for drilled shafts. Use access tubes with 2 in [50 mm] inner diameters that are made of Schedule 40 steel pipe. Provide tubes, including pipe joints, with a round, regular internal diameter that allows a 1.3 in [33 mm] diameter source and receiver probes to pass unobstructed. Make the tubes and joints watertight and corrosion free, with clean surfaces that allow a good bond between the concrete and the tubes.

Install access tubes to the full depth of each shaft for CSL testing equipment. Unless otherwise required by the Contract, install the number of access tubes in each drill shaft in accordance with Table 516:4, “Minimum Number of Access Tubes per Drilled Shaft.”

<table>
<thead>
<tr>
<th>Planned Shaft Diameter, ft [m]</th>
<th>Minimum Number of Access Tubes</th>
</tr>
</thead>
<tbody>
<tr>
<td>D ≤ 3.0 [D ≤ 0.9]</td>
<td>3</td>
</tr>
<tr>
<td>3.0 &lt; D ≤ 4.0 [9.0 &lt; D ≤ 1.2]</td>
<td>4</td>
</tr>
<tr>
<td>4.0 &lt; D ≤ 5.0 [1.2 &lt; D ≤ 1.5]</td>
<td>5</td>
</tr>
<tr>
<td>5.0 &lt; D ≤ 6.0 [1.5 &lt; D ≤ 1.8]</td>
<td>6</td>
</tr>
<tr>
<td>6.0 &lt; D ≤ 8.0 [1.8 &lt; D ≤ 2.4]</td>
<td>7</td>
</tr>
<tr>
<td>8.0 &lt; D ≤ 10.0 [2.4 &lt; D ≤ 3.0]</td>
<td>8</td>
</tr>
<tr>
<td>D &gt; 10.0 [D &gt; 3.0]</td>
<td>9</td>
</tr>
</tbody>
</table>

Fit tubes with a watertight shoe on the bottom and a removable cap on the top. Attach the tubes to the interior of the reinforcement cage in a regular, symmetric pattern, equally spaced around the perimeter of the cage. Install the tubes parallel to each other and vertical. Start the tubes from the shaft bottom and end at least 3 ft [0.9 m] above the ground, water surface, or both.

Avoid damaging the tubes during reinforcement installation operations in the drilled shaft hole. Before concrete placement, fill the access tubes with clean water and cap the tube tops. Ensure that the access tubes remain full of water until CSL testing is complete. When temperatures below freezing are anticipated, protect the access tubes against freezing by wrapping the exposed tubes with insulating material, adding...
antifreeze to the water in the tubes, or other methods as approved by the Engineer. After concrete placement, avoid breaking the bond between the access tubes and the concrete.

(5) Concrete for Drilled Shafts

In the presence of the Engineer and immediately prior to concrete placement, inspect the hole for caving material falling from the sides or a change in the water elevation. Unless otherwise approved by the Engineer, place drilled shaft concrete within two hours after excavation for the shaft has been approved and the reinforcing cage has been placed. If the concrete placement is delayed or if the hole has become contaminated, remove the cage and verify the integrity of the excavated area, and ensure loose material is removed from the bottom of the hole in accordance with 516.04C(1) Hole Excavation before resetting the reinforcing steel cage. Complete concreting in a shaft and remove the temporary casing within 2 hr of beginning concrete placement. The Authority will not allow retempering concrete that has developed an initial set.

When the wet method is used and prior to placing concrete, ensure that the static water or slurry level is properly maintained in the excavation.

Using a watertight tremie, place concrete in one continuous operation from the bottom to the top of the shaft. Place concrete until acceptable quality concrete reaches the top of the shaft. For a dry shaft, overflow the top with at least 1 ft [300 mm] of concrete. For a wet shaft, overflow the top with at least 5 ft [1.5 m] of concrete. Continue overflow of concrete in shafts until uncontaminated concrete is evident. Before initial concrete sets, consolidate the top 10 ft [3 m] of the shaft using Engineer approved vibratory equipment. Finish the top of the shaft from 3 in [75 mm] lower to 1 in [25 mm] higher than the elevation shown on the Plans. In wet holes, consolidate after removing water above the concrete surface.

Place the discharge end of the watertight tremie at one tremie diameter above the shaft base elevation. Keep the discharge end immersed at least 10 ft [3m] below the surface of the fluid concrete except when concrete is initially placed. Maintain a positive head of concrete in the tremie during concrete placement. If the discharge end is removed from the fluid concrete column during the concrete placement and concrete is discharged above the rising concrete surface into displaced water, remove the reinforcing cage and concrete, complete sidewall removal as directed by the Engineer, and reconstruct the shaft.

If the top of the shaft is above ground, form the shaft from the top to at least 2 ft [1.6 m] below finished ground. If the top of the shaft is below ground, use a temporary oversize surface casing to control material caving into the freshly placed concrete.

The Engineer will sample concrete for acceptance at the point of discharge into the tremie or concrete pump hopper. Cure exposed concrete surfaces in accordance with Section 509, “Structural Concrete.”

During concrete placement and curing, ensure that the concrete temperature does not exceed 150 °F [65 °C]. When drilled shaft diameter exceeds 6 ft [1,830 mm], use recording thermometers, maturity meters, or other means as directed by the Engineer to...
monitor temperatures inside the drilled shaft. Ensure that the temperature difference between the core of the shaft and the outer edges does not exceed 36 °F [20 °C]. When drilled shaft concrete temperatures exceed 150 °F [65 °C] or when the temperature difference between the core and the outer edges exceed 36 °F [20 °C], reject the shaft.

Record and document the volume of concrete used in each drilled shaft and provide this information to the Engineer.

(a) Tremies

The Authority defines tremies as tubes that discharge concrete at the shaft base. Use watertight tremies to place concrete in wet or dry holes. Ensure the bottom of the tremie can be sealed and charged with concrete in the dry, and then opened in place at the bottom of the shaft. The Authority will not allow the use of tremies containing aluminum parts that will come in contact with concrete. Ensure that the tremie can be lowered rapidly to retard or stop the flow of concrete. In order to ensure tremie is lowered to the proper depth, mark tremie prior to lowering.

Provide a watertight tremie with an inner diameter from 10 in to 14 in [254 mm to 350 mm], clean and smooth surfaces, and a wall that prevents crimping or sharp bends. Fit the top with a hopper. Ensure that the joints are water tight. Construct the discharge end of the tremie to allow free radial concrete flow during placement.

(b) Concrete Pumps

Pump concrete into a watertight tremie as specified above. Pump concrete in one continuous operation from bottom to the top of the shaft. For wet holes, use a device at the end of the discharge tremie to seal out water while the tremie fills with concrete. If a plug is used, remove it from the hole. Alternatively, use a plug of Engineer approved material that will prevent a defect in the shaft.

(6) Application of Construction Loads

If the Contract requires Integrity Testing, the shaft must pass Integrity Testing before application of any loads or proceeding with the construction of the pier. If the Contract does not require Integrity Testing or the Integrity Testing passes the tests, wait a minimum of 24 hours and meet the requirements of 509.04C.(2)(b) before application of construction loads. Determine strengths from test cylinders cured at the work site under similar environmental conditions in accordance with Section 701, “Portland Cement Concrete.”

(7) Integrity Testing of Drilled Shafts

(a) General

Perform CSL testing on the first production shaft of each diameter specified in the plans. No additional shafts may be placed until:
• The Contractor demonstrates that the drilled shafts can be constructed in accordance with the Contractor’s drilled shaft installation plan, and to the satisfaction of the Engineer, and

• An integrity testing consultant, provided by the Contractor and registered in the State of Oklahoma, has provided the analysis of the tests results including their recommendation to the Engineer.

If the Engineer concurs with the Consultant’s recommendation for acceptance, then construction may continue on the remaining shafts using the same construction methods which were used to produce the tested shaft. Construct all subsequent shafts with CSL tubes for the purposes of additional testing.

Provided that all procedures are followed and repeated from the tested shaft, perform additional CSL testing on every sixth drilled shaft. OTA may require testing, at no additional cost to the Authority, on any subsequent shaft not constructed in the same manner as the tested shaft, or where a construction incident occurs which could compromise the shaft’s integrity. If defects are discovered, but the Engineer determines that the defects are structurally adequate, the Engineer may accept the shaft in accordance with Subsection 105.03 of the Standard Specification. Otherwise, repair defective shafts in accordance with Subsection 516.04.C.(8).

Except for the initial shaft, CSL testing is not required on any shaft constructed using the dry method.

(b) PIT (Pile Integrity Testing - Pulse Echo)

Provide Pile Integrity Testing (PIT) only when no other means of testing is readily available and when CSL tubes are not provided. When the Engineer does approve PIT testing, test in accordance with ASTM D5882 and as specified below. After placing concrete in a drilled shaft, wait a minimum of 7 days or ensure the drilled shaft concrete obtains 75% of its design strength prior to the start of the test. Limit PIT to drilled shafts having L/D ratio ≤ 30, where L is the length of the drilled shaft and D is the diameter of the drilled shaft. The Engineer will reject the shaft when PIT testing shows voids or discontinuities.

(c) Crosshole Sonic Logging (CSL)

1) General

Provide Crosshole Sonic Logging (CSL) in accordance with ASTM D6760 and as specified in the contract or as required by the Engineer. Wait a minimum of three (3) days or four (4) days if retarders are used before starting CSL testing. Provide the Engineer a minimum of three (3) days notice prior to starting the testing.

2) CSL Test Equipment

Use CSL test equipment that can perform the following functions:

• display individual CSL records,
• record CSL data,
• analyze receiver responses,
• print logs,
• test in 2 in [50 mm] inside diameter (ID) access tubes,
• generate an ultrasonic voltage pulse to excite the source with a synchronized triggering system to start the recording system,
• measure and record the depths of probes as the time signals are recorded, and
• filter and amplify signals

3) CSL Logging Procedure

Inspect CSL tubes to ensure that probes will freely pass through the entire tube length. Replace tubes with cored holes that restrict the passage of the probes at no expense to the Authority. To ensure the cored holes do not damage the reinforcing steel cage, locate cored holes approximately 6" inside the cage. Should the cored holes encounter any voids, poor quality concrete, or any other findings; document the finding and elevations and make this information available to the Engineer.

Test all possible combinations of perimeter tube pairs and diagonal tube pairs. Perform CSL tests with the source and receiver probes in the same horizontal plane. Make CSL measurements at depth intervals of 2 in [50 mm]. Pull the probes, starting from the bottom of the tubes, over a depth-measuring device. Remove slack from the cables before pulling to provide accurate depth measurements. Report indicated defects to the Engineer and conduct further tests to evaluate the extent of the defects.

4) CSL Testing Results

In the final report, include the CSL logs with analyses of the initial pulse arrival time versus depth and pulse energy (or amplitude) versus depth. Present a CSL log for each tube pair tested with significant anomalies and/or defects indicated on the logs and discussed in the test report. Unless otherwise specified by the Engineer, accept test results in accordance with Table 516:5. Include the following in the report:

$ a summary of the test results that covers drilled shaft identification,
$ test date
$ shaft age at time of CSL testing,
$ drilled shaft diameter,
$ number of CSL tubes tested,
$ test length,
$ average compression velocity, and
$ waterfall” diagram plotted as a function of time versus depth

DRILLED SHAFT FOUNDATIONS

SP 516 - 14 of 19
In the report include the following items for any significant anomalies and/or defect descriptions:

- the CSL tube number or tube combinations,
- depth below concrete top,
- percent concrete wave velocity reduction, and
- description of anomalies and/or defects.

The Engineer will evaluate the CSL test results and determine the acceptability of the drilled shaft construction in accordance with Table 516:5, “Acceptance of Drilled Shafts.”

<table>
<thead>
<tr>
<th>Concrete Condition Rating</th>
<th>Rating Symbol</th>
<th>Velocity Reduction</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>G</td>
<td>0 to 10%</td>
<td>Acceptable Concrete</td>
</tr>
<tr>
<td>Questionable</td>
<td>Q</td>
<td>10 to ≤20%</td>
<td>Minor concrete contamination</td>
</tr>
<tr>
<td>Poor</td>
<td>P/D</td>
<td>&gt; 20%</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Water</td>
<td>W</td>
<td>V = 4760 to 5005 ft/sec [1,450 to 1,525 m/sec]</td>
<td>Water or water with gravel, Unacceptable</td>
</tr>
<tr>
<td>No Signal</td>
<td>NS</td>
<td>No signal received</td>
<td>*Soil intrusion or tube debonding</td>
</tr>
</tbody>
</table>

Table 516:5
Acceptance of Drilled Shafts
*Additional testing is required to determine cause for no signal, soil intrusion into the drilled shaft is unacceptable, debonding leads to false readings.

Note: Velocity Reduction (VR) is defined as VR = \([1 - V/13,000]\)100% where V is the theoretical compressional wave velocity in concrete measured in ft/sec refer to Publication No. FHWA-NHI-10-016 equation 20-4.

5) Abandoning CSL Access Tubes

After completing CSL testing and obtaining the Engineer’s approval to continue construction above the shafts, dewater the tubes and use portland cement grout to fill the access tubes in the drilled shafts. Submit the grout mix design and grouting method for the Engineer’s approval. Saw cut the top of the CSL tubes even with the top of the drilled shaft.

(d) Core Drilling of Drilled Shaft Concrete

If nondestructive testing indicates voids or discontinuities, or if there are other concerns about a drilled shaft, the Engineer may require full depth coring to determine the soundness of a drilled shaft using continuous coring with an “NW” size core barrel in accordance with ASTM D2113. The Engineer will specify the number, depth, and location of cores.

Submit the methods and equipment for coring and grouting to the Engineer for approval before coring. Store the cores in a commercially available core box and mark the shaft depth at each core recovery interval. Submit the cores and a log for recovered cores.

When the Engineer determines that the quality of the concrete in the shaft, represented by the core samples, is acceptable, construction may proceed. The drilled shaft will be considered defective if the Engineer determines that the quality of the concrete in the core is unacceptable.

(8) Defective Shafts

If the Engineer determines a drilled shaft to be potentially defective based on CSL test results, construction inspection records, and/or structural evaluation, the Contractor may do additional testing and/or investigations. The additional testing may include, but is not limited to crosshole tomography imaging using vertically offset crosshole sonic measurements and recordings to evaluate the extent of anomalous zones, gamma-gamma testing to evaluate differences in relative density surrounding suspected tube debonding,
secondary CSL testing 7 to 10 days after the initial test to investigate for improved concrete condition due to delayed curing, or continuous coring of the drilled shaft. All test procedures must be accepted and approved by the Engineer. Regardless of the test results, all additional integrity testing will be done at the Contractor’s expense and in accordance with the procedure noted above. No allowance for an increase in contract time or extension of the contract completion date will be made.

Submit a plan for further investigation or remedial action to the Engineer for approval. Provide written procedures or drawings as appropriate to the Engineer for approval showing any modifications to shaft dimensions, plans for remedial actions of the shafts, or proposed testing. When the anomalous zone is near the surface, repair plan may show the mechanical removal and replacement of the concrete. Straddle shafts must be designed by a Professional Engineer registered in Oklahoma and reviewed by the Engineer. Provide qualifications for subcontractors doing mitigation procedures such as pressure grouting, micro piles, perimeter grouting, or other procedures. At a minimum, provide the following for grouting mitigation: any proposed cutting of high pressure inspection tubes, high pressure washing, water flow testing, flushing (high volume, low pressure washing), down-hole camera observations, grouting procedures, conformance testing, and required documentation. Once the plan has been reviewed and approved by the Engineer, proceed with the remedial action or testing as directed by the Engineer.

The Engineer will make the determination of final shaft acceptance or rejection based on initial and supplemental integrity testing results or repairs done by the Contractor. The Engineer will provide a determination of acceptance of any remedial action proposed by the Contractor. The Engineer may require the complete replacement of the shaft, addition of straddle shafts to compensate for capacity loss, or additional integrity testing including coring. Any remedial action necessary will be done at the Contractor's expense.

516.05 METHOD OF MEASUREMENT

The Engineer will measure the length of Drilled Shafts and Trial Drilled Shafts from the shaft base to the top of the shaft. The Engineer will base measurements on elevations shown on the Plans or approved by the Engineer. The Engineer will not measure corrective work or miscellaneous items, such as, soil samples and rock cores required by the Contract, rebar splices, permanent casings, lost tools and equipment, overreamed excavation, surface excavation and backfill, overflow concrete and concrete placed outside the neat lines of the shaft. If required by the Contract, the Engineer will measure CSL testing per drilled shaft tested. The Engineer will not measure tests for determining the extent of defects. The Engineer will not make reductions in drilled shaft measurements due to obstructions.
516.06 BASIS OF PAYMENT

The Authority will pay for each pay item at the contract unit price per the specified pay units as follows:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) DRILLED SHAFTS</td>
<td>Linear Foot [Meter]</td>
</tr>
<tr>
<td>(B) TRIAL DRILLED SHAFTS</td>
<td>Linear Foot [Meter]</td>
</tr>
<tr>
<td>(C) CROSSHOLE SONIC LOGGING</td>
<td>Each</td>
</tr>
<tr>
<td>(D) OBSTRUCTIONS</td>
<td>Lump Sum</td>
</tr>
</tbody>
</table>

The Authority will pay for the following under a Supplemental Agreement:

- Approved obstructions,
- Nondestructive testing or core drilling required by the Engineer that reveals no structural defects, and
- Contractor soil sampling or rock coring directed by the Engineer.

The Authority will not pay for the following:

- Nondestructive testing or core drilling directed by the Engineer that reveals structural defects,
- Additional NDT testing or core drilling requested by the Contractor done after a shaft has been rejected regardless of the results,
- CSL tubes (all costs for CSL tubes will be included in price bid for drilled shafts), and
- SID devices used to inspect the shaft bottom.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 628
HIGH-TENSION CABLE BARRIER

EOC-2465

These Special Provisions revise, amend, and where in conflict, supersede applicable Sections of the

(Is hereby revised by adding the following :) 

628.03 EQUIPMENT.

The tension meter shall be of the type recommended by the Manufacturer of the cable barrier system
provided, and shall be approved by the Engineer. It shall also be new, calibrated, functional, and
capable of reading the tension on the cable barrier system to within the Manufacturer’s recommended
tolerances.

The device shall be demonstrated by the instructor(s) on how to operate them and provide other helpful
information to the training participants.

It shall be delivered to the _________ Turnpike between the hours of 9:00 am and 3:00 pm, Monday
thru Friday.

628.04 CONSTRUCTION METHODS.

A. GENERAL.

Use a high-tension cable barrier system of four wire ropes with the maximum post spacing
center to center as shown below for each manufacturer, unless otherwise directed by the Plans
or the Engineer.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Maximum Post Spacing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Břifén</td>
<td>8.0 ft [2.4 m]</td>
</tr>
<tr>
<td>Gibraltar</td>
<td>5.0 ft [2.0 m]</td>
</tr>
<tr>
<td>Nucor</td>
<td>5.0 ft [1.5 m]</td>
</tr>
<tr>
<td>Safence</td>
<td>6.5 ft [1.5 m]</td>
</tr>
<tr>
<td>Trinity</td>
<td>5.0 ft [1.5 m]</td>
</tr>
</tbody>
</table>

The Contractor may submit to the engineer test results and/or simulations showing post spacing beyond Maximum Post Spacing listed above, pending the dynamic deflection does not exceed 7.0 feet under NCHRP 350 test level 4 (TL-4) conditions. The anchor spacing for test results and/or simulations must be a minimum of 3,280 ft [1,000 m]. Testing and simulations shall be conducted by a reputable roadside safety research facility.

628.06 BASIS OF PAYMENT.

<table>
<thead>
<tr>
<th>Pay item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(E) CABLE BARRIER TENSION METER</td>
<td>EACH</td>
</tr>
</tbody>
</table>
These Special Provisions revise, amend, and where in conflict, supersede applicable Sections of the 2010 Standard Specifications for Turnpike Construction.

(Add the following:)

645.05. METHOD OF MEASUREMENT. (c) Lane Rental

A. General
This provision establishes lane rental fees for lane restrictions. All work requiring or resulting in the closure of a lane, ramp, or shoulder will be subject to lane rental fees, and will be administered in accordance with subsection 645.05 C “Lane Rental”.

The Engineer may consider waiver of lane rental fees in the event the lane restriction(s) is removed, and normal traffic is reestablished within thirty (30) minutes of the initial lane restriction(s).

1. Detours, if necessary, shall be established and signed at no additional cost to the Authority.
2. Traffic Control Plan (TCP) shall be compiled by an ATSSA Certified Worksite Traffic Supervisor, for the Engineer’s approval. As a minimum, include in the TCP dates, times, and locations for:
   • Lane Restrictions
   • Ramp Closure
   • Traffic Stoppages
   • Law Enforcement Surveillance
   • Alternate Routes
   • Additional Signing
   • Portable Changeable Message Boards
   • The use of Type ‘C’ Advanced Warning Devices
   • The use of Flagmen
   • Provisions for Temporarily opening all lanes in emergency situations

The Contractor will be required to submit a lane closure plan to the Engineer, with a detailed sequence of operation which corresponds to the TCP and a schedule describing all operations and anticipated time frames of any lane closure on I-44. This plan will only be approved if the scheduled closure times fall within the time frames not subject to lane rental. Submittal of any closure plan shall be done three days prior to any anticipated activity. Failure to receive formal approval of the closure plan prior to the implementation shall justify assessment of lane rental.

All Lane Rental Fees for this project will be assessed based on 15 minute intervals.
B. I-44 (TURNER TURNPIKE) Lane Closures

The following items set forth the lane rental fees for lane closures. The Contractor will not be assessed lane rental fees if, during a period of lane closure normally subject to lane rental fees, the Contractor encounters unforeseen utility conflicts, unusually severe weather, or natural disaster and the Contractor makes every effort to reopen the lane after the adverse condition is encountered.

The Contractor shall maintain traffic in a minimum of two through lanes in each direction on I-44 throughout the entire project length during the hours of 6:00 A.M. to 8:00 P.M. Monday through Thursday, from 6:00 A.M. to 10:00 P.M. Friday, from 9:00 A.M. to 8:00 P.M. Saturday, and from 9:00 A.M. to 10:00 P.M. Sunday. Any closure of a through traffic lane outside the allowed time extent will be assessed a lane rental fee of $10,000 per lane per hour. Total closure of either direction of I-44 will not be permitted. Any occurrence of total closure will be assessed a Lane Rental of $100,000 per direction per hour.

Lane closures for I-44 will be limited to those shown in Table “A”, but will be restricted during Holidays and Special Events as described in Part E of this Special Provision. The Contractor must reopen all lanes when no work is being performed, or a lane rental fee of $10,000 per hour per lane will be assessed.

C. Lane Rental Fees

Lane rental fees for all thoroughfare restrictions will be assessed as presented in Table “A”:

<table>
<thead>
<tr>
<th>Day / Time</th>
<th>6:00 AM - 9:00 AM</th>
<th>9:00 AM - 8:00PM</th>
<th>8:00 PM - 10:00 PM</th>
<th>10:00 PM - 6:00 AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday – Thursday</td>
<td>None ($0)</td>
<td>None ($10,000)</td>
<td>One Lane ($0)</td>
<td>One Lane ($0)</td>
</tr>
<tr>
<td>Allowed Lane Closures Fee (per lane per hour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>None ($10,000)</td>
<td>None ($10,000)</td>
<td>None ($10,000)</td>
<td>One Lane ($0)</td>
</tr>
<tr>
<td>Saturday</td>
<td>One Lane ($0)</td>
<td>None ($10,000)</td>
<td>One Lane ($0)</td>
<td>One Lane ($0)</td>
</tr>
<tr>
<td>Allowed Lane Closures Fee (per lane per hour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunday</td>
<td>One Lane ($0)</td>
<td>None ($10,000)</td>
<td>None ($10,000)</td>
<td>One Lane ($0)</td>
</tr>
<tr>
<td>Allowed Lane Closures Fee (per lane per hour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A lane rental fee of $20,000 per lane per hour per mile will be assessed for thoroughfare restrictions set during special events or holidays as defined in subsection 645.05.A and Table 645:1.

Lane rental fees will be charged in increments of fifteen (15) minutes, and will be assessed on the progressive estimate which follows that in which they were accrued.

D. North 164th Street and Luther Road

Long term lane closures are not anticipated for N. 164th Street or Luther Road. The Contractor may utilize flagmen for single lane traffic during tie-in work at detour ends for constructing detour and removing detour, however lane closures will be kept to a minimum. The Contractor will be charged a lane rental fee of $500 per hour will be charged for any lane closures not complying with these Special Provisions.

E. Special Events and Holidays

The Engineer reserves the right to deny any thoroughfare restrictions for any purpose, during the days surrounding special events or holidays, including the days before and after such occasions. The Holiday durations given below are intended to give the Contractor the best opportunity to plan their activities. Holidays are those proclaimed as such through Executive Order by the Governor. Special events are those which create high traffic volumes such as large Public Events.

- May 25, 2017 at 12:01 A.M. through May 30, 2017 at 11:59 P.M.
- June 29, 2017 at 12:01 A.M. through July 5, 2017 at 11:59 P.M.
- August 3, 2017 at 12:01 A.M. through August 6, 2017 at 11:59 P.M.
- August 31, 2017 at 12:01 A.M. through September 5, 2017 at 11:59 P.M.
- November 22, 2017 at 12:01 A.M. through November 27, 2017 at 11:59 P.M.
- December 22, 2017 at 12:01 A.M. through December 26, 2017 at 11:59 P.M.
- December 29, 2017 at 12:01 A.M. through January 2, 2018 at 11:59 P.M.
- March 30, 2018 at 12:01 A.M. through April 2, 2018 at 11:59 P.M.
- May 24, 2018 at 12:01 A.M. through May 29, 2018 at 11:59 P.M.
- June 29, 2018 at 12:01 A.M. through July 5, 2018 at 11:59 P.M.
- August 3, 2018 at 12:01 A.M. through August 6, 2018 at 11:59 P.M.
- August 30, 2018 at 12:01 A.M. through September 4, 2018 at 11:59 P.M.
- November 21, 2018 at 12:01 A.M. through November 25, 2018 at 11:59 P.M.
- December 21, 2018 at 12:01 A.M. through December 26, 2018 at 11:59 P.M.
- December 28, 2018 at 12:01 A.M. through January 2, 2019 at 11:59 P.M.
- April 19, 2019 at 12:01 A.M. through April 21, 2019 at 11:59 P.M.
- May 23, 2019 at 12:01 A.M. through May 28, 2019 at 11:59 P.M.
- July 3, 2019 at 12:01 A.M. through July 7, 2019 at 11:59 P.M.
- August 2, 2019 at 12:01 A.M. through August 4, 2019 at 11:59 P.M.
- August 29, 2019 at 12:01 A.M. through September 3, 2019 at 11:59 P.M.
- November 27, 2019 at 12:01 A.M. through December 1, 2019 at 11:59 P.M.
- December 20, 2019 at 12:01 A.M. through January 2, 2020 at 11:59 P.M.
In addition to the above holidays and special events, the Contractor will not be allowed to close any lanes from 12 hours before kickoff time until 12 hours after kickoff time on Saturdays (or any other day) that Oklahoma University has a home football game.

During Holiday and Special Event periods, the Contractor will not be allowed to utilize the Access ingress/egress locations to/from the I-44 Mainline. During Holiday or Special Event periods, the Contractor will not be allowed to work inside the I-44 clear zone.

The Contractor will be required to make emergency repairs during the Holiday periods if they are deemed necessary by the Authority. Lane Rentals will not be assessed to the Contractor for making emergency repairs.

E. Post Substantial Completion Lane Closures

The Contractor will be allowed minimal lane closures after “Substantial Completion” of the project. Any lane closure allowed for this work must be approved by the Engineer and must adhere to the restrictions outlined in this Special Provision for I-44. Submittal of any lane closure plan shall be done three days prior to any anticipated activity. Failure to receive formal approval of the lane closure plan prior to the implementation shall justify assessment of lane rental.

The Contractor will be allowed to close the shoulder after substantial completion is reached, however, each closure will be reviewed by the Engineer for safety and may be rejected or delayed until lane rental hours are applicable if deemed not safe.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 701
OPTIMIZED GRADATION FOR PORTLAND CEMENT CONCRETE PAVEMENT
EOC-2465


(Add the following:)

701.01 MIX DESIGN AND PROPORTIONING

A. Classes of Concrete

If the Contractor provides a Class A concrete utilizing an Optimized Gradation Concrete Mix Design (OGCMD) procedure for use in Portland Cement Concrete Pavements, integral curb, combined curb and gutter, concrete sidewalk, concrete driveways and divider strip, the minimum cement content may be reduced to 470 lbs/yd³ [279 kg/m³]. Ensure Class A concrete used in OGCMD Pavements has a minimum flexural strength of 700 psi [4.83 MPa] at 28 days when tested in accordance with AASHTO T 97. Flexural strength testing will only be required for OGCMD approval and field testing of flexural strength will not be required of the Contractor or Engineer. At the option of the Engineer, the Authority may test flexural strength for acceptance or verification purposes.

C. Proportioning

For Class A and AP concrete utilizing an OGCMD procedure, ensure the concrete mix design is based on an absolute volume method for the class of concrete specified. Ensure the consistency of the concrete used for concrete pavement or curb and gutter is suitable for satisfactory placement of the concrete by slipform paving. Ensure OGCMD concrete mixtures are designed and produced in conformance with sections 414, 609, 610, 701, 15a, special provision, and all appropriate special provisions in the contract. Ensure the OGCMD concrete used for high early strength concrete meets the minimum 28 day compressive strength requirement within 72 hours of placement. Submit an optimized gradation mix design at least 30 days before production to the Engineer. Do not place any optimized gradation concrete until the mix design is reviewed and approved by the Engineer.

Include at least the following information with each Optimized Gradation Concrete Mix Design:

• Project identification
• Name and address of the contractor and producer
• A unique mix design name along with the mix designs class designation
• Expected travel time from batch to placement
• Aggregate sources
  • Gradations for each aggregate source. Sieve sizes shall include the 1 ½ in. [37.5mm], 1 in. [25.0mm], ¾ in.[19.0mm], ¼ in. [12.5mm], d in. [9.5mm], No. 4 [4.75mm], No. 8 [2.36mm], No. 16 [1.18mm], No. 30 [600μm], No. 50 [300μm], No. 100 [150μm], and the No. 200 [75μm].
• Hydraulic cement type and source
• Types of cement replacement, if used, and sources
• Types of admixtures and sources
• Material proportions
• Combined gradation charts
  o Coarseness / Workability Chart
  o 0.45 Power Curve
  o Percent Retained Chart (see Figure A1)
• Air content
• Slump
• Unit weight
• Water / cementitious materials ratio
• Compressive and flexural strengths at 7 and 28 days
• Compressive strength at 72 hours for high early strength concrete
• When the combined aggregate gradation contains less than 40% natural sand fine aggregate, provide the results of the acid insoluble residue test described in OHDL-25 for the combined aggregate that passes the No. 4 [4.75mm] sieve.

The optimized gradation concrete mix design and the initial job mix formula are the responsibility of the contractor. Provide one uniquely named mix design for each type of portland cement concrete utilizing an optimized gradation. Ensure the job mix formula provided has a combined aggregate gradation that plots in Area II on a Coarseness/Workability Chart as described in OHDL-52. The initial job mix formula shall establish a single percentage of aggregate passing each required sieve in 701.01.B.(6). for the combined aggregate gradation. Ensure that all necessary quality control steps are taken to maintain control of the combined aggregates job mix formula and ensure that all field samples plot in area II as described in OHDL-52.

Ensure the combined aggregate that passes the No. 4 [4.75mm] sieve has an acid insoluble residue of at least 50% by weight when tested in accordance with OHDL-25.

Determining an optimum combined aggregate blend will require the use of OHDL-52 Figures 1 and 2 and Figure A1 as provided in the special provisions. Area II of the coarseness/workability chart will be the primary method used to ensure the aggregate combination will produce a concrete mixture with the appropriate properties for the intended application and placement method. Optimized Gradation Concrete Mix Designs that plot outside of Area II will not be approved. The 0.45 power curve and Figure A1 will
be used as secondary means to verify the coarseness/workability chart results and to identify areas deviating from a well graded aggregate combination. Any optimized gradation that plots outside the boundary limits of Figure A1 may be rejected.

To meet the optimized graded concrete pavement provision criteria, the batch weights, individual aggregate sieve analysis, SSD specific gravities of the aggregates, and other material information will be inputted into the OGCP spreadsheet, available online at http://www.optimizedgraded.com/recommended-specification.html or from the Engineer. The OGCP spreadsheet will evaluate the following requirements:

- The combined gradation must be within the boundary limits for each sieve size.
- The total volume of fine sand (#30-200) must be within 24% and 34% of the aggregate content used.
- The total volume of coarse sand (#8-#30) must be 15% or greater.
- Limit the flat or elongated coarse aggregate to 15% or less at a ratio of 1:3 according to ASTM 4791.

Submit new mix designs if:

1. The optimized gradation concrete mix design is rejected by the Engineer,
2. The source of any material changes, or
3. The mix design produces unacceptable workability or production test results.

701.05 FINE AGGREGATE

OPTIMIZED GRADATION FOR PORTLAND CEMENT CONCRETE PAVEMENT
B. General Requirements

Fine Aggregate used for OGCMD Class A and AP concretes for Portland Cement Concrete Pavement does not have to meet the gradation requirements of section 701.05C; the gradation requirements provided in Section 701.01 of this special provision shall be met instead.

All natural sand sources of fine aggregate shall be from a fine aggregate source on the Approved Materials List for use in hydraulic cement concrete or limited use. All crushed fine aggregate (manufactured sand) in the mix shall be obtained from a coarse aggregate source on the Approved Materials List for use in hydraulic cement concrete.

701.06 COARSE AGGREGATE

B. General Requirements

Coarse Aggregate used for OGCMD Class A and AP concretes for Portland Cement Concrete Pavement does not have to meet the gradation requirements of section 701.06; the gradation requirements provided in Section 701.01 of this special provision shall be met instead.

All OGCMD aggregate sources that have material retained on or above the ½ inch [12.5 mm] sieve will be considered coarse aggregate. Ensure all coarse aggregate is obtained from a source on the Approved Materials List for use in hydraulic cement concrete.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 708
HAMBURG RUT TESTING OF HOT MIX ASPHALT
EOC-2465


708.04 COMPOSITION OF MIXTURES (Revise the following:)

Remove references to APA rut depth in Tables 708:8, 708:9, 708:10, and 708:11.

Add the following Table between Tables 708:11 and 708:12:

<table>
<thead>
<tr>
<th>Table 708:11a</th>
<th>Hamburg Rut Test Requirements* b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binder Grade</td>
<td>Minimum Number of Passes to 12.50 mm Rut Depth, Tested at 122 °F</td>
</tr>
<tr>
<td>PG 64</td>
<td>10,000</td>
</tr>
<tr>
<td>PG 70</td>
<td>15,000</td>
</tr>
<tr>
<td>PG 76</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Note: For the purposes of this table, PG64, PG70, and PG76 refer to the high temperature grade of the binder.

* Rut test requirements apply to Superpave, SMA, and RIL mixes only.

b Pre-existing mix designs meeting the APA rut requirements may be accepted by the Engineer.

708.06 SAMPLING AND TESTING (Amend Table 708:13 to include the following:)

<table>
<thead>
<tr>
<th>Table 708:13</th>
<th>Sampling and Testing of Aggregates, Bituminous Mixtures, and Asphalt Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>Testing Method</td>
</tr>
<tr>
<td>Bituminous Mixtures</td>
<td>Rutting susceptibility using the Hamburg Rut Tester</td>
</tr>
</tbody>
</table>

HAMBURG RUT TESTING OF HOT MIX ASPHALT
SP 708 - 1 of 1
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 708
PLANT MIX BITUMINOUS BASES AND SURFACES
(SUPERPAVE)
EOC-2465

These special provisions revise, amend, and where in conflict, supersede applicable sections of the Standard Specifications for Turnpike Construction, Edition of 2010

708.02 MINERAL AGGREGATE (Replace Table 708:1 with the following:)

<table>
<thead>
<tr>
<th>Test</th>
<th>Superpave</th>
<th>Stone Matrix Asphalt</th>
<th>Permeable Friction Course</th>
<th>Rich Bottom Layer</th>
<th>Open Graded Friction Surface Course</th>
<th>Open Graded Bituminous Base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PG64</td>
<td>PG70</td>
<td>PG76</td>
<td>PG64</td>
<td>PG76</td>
<td>PG64</td>
</tr>
<tr>
<td>L.A. Abrasion (^a), % wear</td>
<td>(\leq 40)</td>
<td>(\leq 40)</td>
<td>(\leq 40)</td>
<td>(\leq 30)</td>
<td>(\leq 30)</td>
<td>(\leq 30)</td>
</tr>
<tr>
<td>Micro-Deval (^a), % wear</td>
<td>—</td>
<td>—</td>
<td>(\leq 25)</td>
<td>(\leq 25)</td>
<td>—</td>
<td>(\leq 25)</td>
</tr>
<tr>
<td>Sand equivalent (^b)</td>
<td>(\geq 40)</td>
<td>(\geq 45)</td>
<td>(\geq 50)</td>
<td>—</td>
<td>(\geq 40)</td>
<td>—</td>
</tr>
<tr>
<td>Mechanically Fractured Faces (^b, c, h), %</td>
<td>(\geq 85/80)</td>
<td>(\geq 95/90)</td>
<td>(\geq 98/95)</td>
<td>(\geq 98/95)</td>
<td>(\geq 85/80)</td>
<td>(\geq 98/95)</td>
</tr>
<tr>
<td>Aggregate Durability Index (^a)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
</tr>
<tr>
<td>Insoluble Residue (^d, e), %</td>
<td>(\geq 30)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
<td>(\geq 40)</td>
<td>—</td>
<td>(\geq 40)</td>
</tr>
<tr>
<td>Flat and Elongated (^f), %</td>
<td>(\leq 10)</td>
<td>(\leq 10)</td>
<td>(\leq 10)</td>
<td>(\leq 10)</td>
<td>(\leq 10)</td>
<td>(\leq 10)</td>
</tr>
<tr>
<td>Natural Sand and Gravel (^h), %</td>
<td>(\leq 15)</td>
<td>(\leq 15)</td>
<td>(\leq 15)</td>
<td>0</td>
<td>(\leq 15)</td>
<td>0</td>
</tr>
<tr>
<td>Clay Balls and Silt, %</td>
<td>(\leq 1.0)</td>
<td>(\leq 1.0)</td>
<td>(\leq 1.0)</td>
<td>0</td>
<td>(\leq 1.0)</td>
<td>0</td>
</tr>
<tr>
<td>Soft Particles (^a), %</td>
<td>(\leq 5)</td>
<td>(\leq 5)</td>
<td>(\leq 5)</td>
<td>(\leq 5)</td>
<td>(\leq 5)</td>
<td>(\leq 5)</td>
</tr>
<tr>
<td>Sticks or Roots (^a), %</td>
<td>(\leq 0.5)</td>
<td>(\leq 0.5)</td>
<td>(\leq 0.5)</td>
<td>0</td>
<td>(\leq 0.5)</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 708:1
Physical Properties of Aggregates

Note: For this table: PG64, PG70, and PG76 refer to the high temperature grade of the binder. Unless otherwise noted, specifications for PG binder grades higher than PG76 will use PG76 specifications.

a Applies to each source.

b Applies to the combined aggregate.

c Applies to the aggregate retained on the No. 4 [4.75 mm] sieve.

d Applies to the combined coarse aggregate.

e Applies to the coarse aggregate in the surface course. Does not apply to shoulders, driveways, and temporary detours.

f A flat and elongated piece has a length greater than five times the thickness.

g Applies to combined aggregate. If the maximum for the combined aggregate is not exceeded, the Authority will allow 1.5% for one source.

h In the mechanically fractured faces requirement format “xx/yy”, “xx” is the minimum percentage of coarse aggregate requiring one fractured face, and “yy” is the percentage requiring two fractured faces.

708.04 COMPOSITION OF MIXTURES

A. Asphalt Mix Design and Initial Job-Mix Formula

Ensure the initial JMF is in accordance with Tables 708:6, 708:8, and 708:9, or Tables 708:7, 708:8, and 708:9 for the type of mix required by the Contract. Prepare a trial mixture in accordance with Subsection 411.04.C. Propose changes to the JMF if the trial, prepared at the initial JMF proportions, fails to meet the requirements of Tables 708:6, 708:10, 708:11, and 708:12, or Tables 708:7, 708:10, 708:11, and 708:12. If the changes do not produce a mix design in accordance with these tables, the Engineer will require a new mix design. If the changes do produce a mix design in accordance with these tables, the Engineer will approve the changes for adjustment of the JMF.

B. Plant Produced Mixtures

Provide a uniform, plant produced mixture of the combined aggregate and asphalt in accordance with Tables 708:6, 708:10, and 708:11, or Tables 708:7, 708:10, and 708:11 within the specification limits established by the JMF with allowable tolerances.

After the plant is in operation, propose any necessary adjustments to the JMF in accordance with Table 708:6 or Table 708:7. If test results indicate the adjustments are in accordance with Tables 708:10 and 708:11, adjust the JMF accordingly.
C. Reclaimed Asphalt Pavement (Replace the 2nd paragraph with the following:)

Regardless of the layer or binder type, the Engineer will accept superpave mixtures with no greater than 25 percent RAP for shoulders, driveways, and layers serving as a bond breaker under PCC pavements if the mixture meets the Contract requirements for the type or grade. Superpave mixtures containing up to 35 percent RAP will be accepted in temporary detours if the mixture meets the Contract requirements for the type or grade, and if the mixture can be produced meeting air quality standards set forth by the Oklahoma Department of Environmental Quality. Temporary is defined as any material that will not become part of any permanent pavement. Temporary material must be removed before the end of the project.

(Replace Table 708:6 with the following:)

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing per Superpave Mixture Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S2</td>
</tr>
<tr>
<td>1½ in [37.5 mm]</td>
<td>100</td>
</tr>
<tr>
<td>1 in [25.0 mm]</td>
<td>90 – 100</td>
</tr>
<tr>
<td>3/4 in [19.0 mm]</td>
<td>≤ 90</td>
</tr>
<tr>
<td>1/2 in [12.5 mm]</td>
<td>—</td>
</tr>
<tr>
<td>3/8 in [9.5 mm]</td>
<td>—</td>
</tr>
<tr>
<td>No. 4 [4.75 mm]</td>
<td>≥ 40</td>
</tr>
<tr>
<td>No. 8 [2.36 mm]</td>
<td>29 – 45</td>
</tr>
<tr>
<td>No. 16 [1.18 mm]</td>
<td>—</td>
</tr>
<tr>
<td>No. 30 [0.600 mm]</td>
<td>—</td>
</tr>
<tr>
<td>No. 50 [0.300 mm]</td>
<td>—</td>
</tr>
<tr>
<td>No. 100 [0.150 mm]</td>
<td>—</td>
</tr>
<tr>
<td>No. 200 [0.075 mm]</td>
<td>1.0 – 7.0</td>
</tr>
</tbody>
</table>

Other Mixture Requirements

<table>
<thead>
<tr>
<th>NMS c</th>
<th>No. [25 mm]</th>
<th>¾ in [19 mm]</th>
<th>½ in [12.5 mm]</th>
<th>½ in [19 mm]</th>
<th>No. 4 [4.75 mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Cement</td>
<td>≥ 3.9</td>
<td>≥ 4.3</td>
<td>≥ 4.8</td>
<td>≥ 5.3</td>
<td>≥ 5.8</td>
</tr>
<tr>
<td>Performance grade asphalt cement</td>
<td>e</td>
<td>e</td>
<td>e</td>
<td>e</td>
<td>e</td>
</tr>
</tbody>
</table>

* Table 708:6 reflects the sieve size boundaries for design and JMF purposes. After the design is established, the JMF will designate combined aggregate sieve requirements with tolerances in Table 708:12.

b Ensure the ratio of the percent passing the No. 200 [75 µm] sieve to the percent effective asphalt cement is from 0.6 to 1.6.

c Nominal Maximum Size (NMS) is defined as one size larger than the first sieve to retain more than 10 percent.

d The Engineer may adjust the lower limit if the effective specific gravity of the combined aggregates is greater than 2.65. The Engineer may allow adjustments if a theoretical lab molded specimen at the JMF asphalt content meets the VMA requirement at 4% air voids.

e The Contractor may substitute a higher grade of asphalt than that shown on the Plans at no additional cost to the Authority.
Replace Table 708:8 with the following:

<table>
<thead>
<tr>
<th>Property</th>
<th>Superpave</th>
<th>SMA</th>
<th>PFC</th>
<th>RBL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of SGC Gyrations</td>
<td>50</td>
<td>60</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Required Density, % of G&lt;sub&gt;mm&lt;/sub&gt;</td>
<td>85.5 - 91.5</td>
<td>85.5 - 90.5</td>
<td>85.5 - 89.0</td>
<td>—</td>
</tr>
<tr>
<td>VMA, %</td>
<td>≥ 13.5</td>
<td>≥ 13.5</td>
<td>≥ 14.5</td>
<td>≥ 15.5</td>
</tr>
<tr>
<td>VFA, %</td>
<td>67 - 73</td>
<td>70 - 75</td>
<td>72 - 77</td>
<td>73 - 78</td>
</tr>
</tbody>
</table>

Note: For this table: PG64, PG70, and PG76 refer to the high temperature grade of the binder. Unless otherwise noted, specifications for PG binder grades higher than PG76 will use PG76 specifications.

*Indirect Tensile Strength from AASHTO T 283, preconditioned specimen average, in psi.

Replace Table 708:9 with the following:

<table>
<thead>
<tr>
<th>Property</th>
<th>Superpave</th>
<th>SMA</th>
<th>PFC</th>
<th>RBL</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMA, %</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>VFA, %</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

VFA is based on the bulk specific gravity of the aggregates.

VFA is defined as the percentage of VMA containing asphalt binder.
Replace Table 708:10 with the following:

<table>
<thead>
<tr>
<th>Property</th>
<th>Superpave</th>
<th>SMA</th>
<th>PFC</th>
<th>RBL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PG64</td>
<td>PG70</td>
<td>PG76</td>
<td>PG76</td>
</tr>
<tr>
<td>Number of SGC Gyrations</td>
<td>N&lt;sub&gt;ini&lt;/sub&gt;</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Required Density, % of G&lt;sub&gt;mm&lt;/sub&gt;</td>
<td>N&lt;sub&gt;des&lt;/sub&gt;</td>
<td>85.5 – 91.5</td>
<td>85.5 – 90.5</td>
<td>85.5 – 89.0</td>
</tr>
<tr>
<td>VMA, %</td>
<td>See Table 708:11</td>
<td>≥ 12.0</td>
<td>≥ 13.0</td>
<td>≥ 14.0</td>
</tr>
<tr>
<td>VFA, %</td>
<td>See Table 708:11</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Lab Permeability, cm/s × 10&lt;sup&gt;-5&lt;/sup&gt;</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>TSR, Min.</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>—</td>
</tr>
<tr>
<td>ITS&lt;sup&gt;a&lt;/sup&gt;, psi</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Draindown, %</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Note: For this table: PG64, PG70, and PG76 refer to the high temperature grade of the binder. Unless otherwise noted, specifications for PG binder grades higher than PG76 will use PG76 specifications.

<sup>a</sup> Indirect Tensile Strength from AASHTO T 283, preconditioned specimen average, in psi.

(Add the following:)

<table>
<thead>
<tr>
<th>Property</th>
<th>Superpave</th>
<th>SMA</th>
<th>PFC</th>
<th>RBL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S2</td>
<td>S3</td>
<td>S4</td>
<td>S5</td>
</tr>
<tr>
<td>VMA&lt;sup&gt;b&lt;/sup&gt;, %</td>
<td>≥ 12.0</td>
<td>≥ 13.0</td>
<td>≥ 14.0</td>
<td>≥ 15.0</td>
</tr>
<tr>
<td>VFA&lt;sup&gt;b&lt;/sup&gt;, %</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<sup>b</sup> VMA is based on the bulk specific gravity of the aggregates. Compute a new bulk specific gravity from each AASHTO T 209 test. Calculate the value by multiplying the aggregate Effective Specific Gravity (G<sub>se</sub>) calculated from the latest AASHTO T 209 test by the aggregate Bulk Specific Gravity (G<sub>sb</sub>) from the design. Afterwards, divide the product by the aggregate G<sub>se</sub> from the design.

<sup>b</sup> VFA is defined as the percentage of VMA containing asphalt binder.
708.06 SAMPLING AND TESTING

(Delete the following row from Table 708:13 under the “Aggregates” section:)

| Uncompacted void content of fine aggregate | AASHTO T 304, Method A |

(Delete the following row from Table 708:13 under the “Bituminous Mixtures” section:)

| Rutting susceptibility using the asphalt pavement analyzer | OHD L-43 |

(Add the following row to Table 708:13 under the “Bituminous Mixtures” section:)

| Rutting susceptibility using the Hamburg Rut Tester | OHD L-55 |
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 711
TRAFFIC STRIPE
EOC-2465


(Add the following):

711.01 MATERIAL FOR HOT-APPLIED THERMOPLASTIC COMPOUNDS

A. General

Provide hot-applied thermoplastic compound in accordance with AASHTO M 249. Provide binder component made of hydrocarbon-based material.

Each bag must contain 50 lb [22.7 kg] of material. Clearly mark each bag with the following information:

- Color,
- Weight,
- Pigment type (for yellow only), and
- Lot or batch number (for each mix or blend that produces a finished product ready for use).

B. Lead-Free Yellow

(1) Pigments

Provide lead-free yellow and filler pigments that will pass a No. 200 U.S. Standard Sieve [0.075 mm] after being washed free of resins by solvent washing. The lead-free yellow and filler pigments must each meet the following specific requirements:

- **Prime.** The yellow pigment must be lead-free, organic yellow (C.I. Pigment Yellow 83, opaque version); and must be heat resistant and weather stable. Do not mix pigment types within a batch. Notify the Engineer for evaluation and approval before using alternate pigments, other than those listed in the Plans, in the formulation.
- **Filler.** The filler pigment must be 95 percent pure calcium carbonate.
- **Binder.** The binder must consist of a mixture of resins (at least one of which is a solid at room temperature) and high-boiling point plasticizers. At least one-third of the binder composition must be a hydrocarbon resin and must be no less than 8 percent by weight of the entire formulation.
- **Silica.** The total silica used in the formulation must be in the form of glass traffic beads.
• **Glass Traffic Beads.** The glass traffic beads used in the formulation must meet the requirements of AASHTO M 247, Type I.

(2) **Physical Characteristics**

Unless otherwise required by the contract, provide a finished thermoplastic pavement marking material that is a free-flowing granular material. When in storage, the material must remain in a free flowing state for at least 6 months if stored at temperatures of 100 °F [37.8 °C] or less. Produce material that is readily applied using thermoplastic equipment at temperatures from 400 °F [204 °C] to 425 °F [218 °C].

(3) **Toxicity**

Provide materials that when at temperatures equal to or less than 445 °F [229 °C] will not give off fumes that are toxic or otherwise injurious to persons, animals, or property.

Provide traffic stripe materials that are non-hazardous as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Provide supporting independent analytical data or product Material Safety Data Sheets (MSDS) that identify the materials to be non-hazardous.

Provide traffic strip material that contains less than or equal to 5.0 ppm of lead by weight if tested in accordance with the RCRA reference above. Submit supporting independent analytical data of the lead content to the Engineer.

(4) **Material Stability**

The material must not break down or deteriorate when heated to 400 °F [204 °C] for 4 h.

(5) **Temperature versus Characteristics**

The temperature versus viscosity characteristics of the material in the plastic state must remain constant for up to four re-heatings to 400 °F [204 °C], and be consistent from batch to batch.

(6) **Chemical Resistance**

Provide thermoplastic marking materials that are not affected by contact with the following:

- Sodium chloride, calcium chloride, or other similar chemicals on the roadway surface,
- Oil content in the pavement materials, or
- Oil on the roadway surface that was dropped by traffic.

(7) **Softening Point**

Provide material that will not soften at 194 °F [90 °C] when tested by the ring and ball method in accordance with ASTM E 28.
(8) **Color**

Provide material with daytime CIE chromaticity coordinates that fall within an area in accordance with Table 711:1, “Daytime CIE Chromaticity Coordinate Corner Points.”

<table>
<thead>
<tr>
<th>Table 711:1</th>
<th>Daytime CIE Chromaticity Coordinate Corner Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>1</td>
</tr>
<tr>
<td>Yellow</td>
<td>x</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.435</td>
</tr>
</tbody>
</table>

The yellow material must meet the requirements in Table 711:1, “Daytime CIE Chromaticity Coordinate Corner Points,” before and after 500 hours of Weather-Ometer exposure. Perform the Weather-Ometer exposure test in accordance with ASTM G 155 using Exposure Cycle 1 with a quartz inner filter glass and a Type “S” borosilicate outer filter glass.

Measure the nighttime CIE chromaticity coordinates of the yellow thermoplastic using a retroreflectometer capable of measuring the night color of pavement markings in accordance with ASTM E 1710. Provide material with nighttime CIE chromaticity coordinates that fall within an area in accordance with Table 711:2, “Nighttime CIE Chromaticity Coordinate Corner Points,” for the life of the stripe:

<table>
<thead>
<tr>
<th>Table 711:2</th>
<th>Nighttime CIE Chromaticity Coordinate Corner Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>1</td>
</tr>
<tr>
<td>Yellow</td>
<td>x</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.53</td>
</tr>
</tbody>
</table>

(9) **Formulation**

Provide yellow thermoplastic traffic stripe that meets the formulation requirements in Table 711.3. “Lead-Free Yellow Formulation Requirements.”

<table>
<thead>
<tr>
<th>Table 711:3</th>
<th>Lead-Free Yellow Formulation Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
<td>Weight, %</td>
</tr>
<tr>
<td>Binder</td>
<td>≥20</td>
</tr>
<tr>
<td>C.I. Pigment Yellow 83 or Medium-chrome yellow</td>
<td>≥1.5 or ≥5.0</td>
</tr>
<tr>
<td>Calcium carbonate</td>
<td>20 – 42</td>
</tr>
<tr>
<td>Glass Traffic Beads</td>
<td>30 – 45</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

711.02 **PERMANENT PAVEMENT MARKING TAPE**

Provide plastic striping tape free of cracks with straight and unbroken edges. Provide material in rolls with no greater than three splices per 150 ft [45.7 m].

Conform preformed words and symbols to the applicable shapes and sizes in accordance with the MUTCD. Package plastic striping tape in standard commercial containers to prevent damage during shipment and storage. Ensure the plastic striping retains the properties required by the Contract when stored at temperatures no greater than 100 °F [38 °C] and for no longer
than 1 year. Provide plastic striping tape in accordance with Subsection 711.02.A, “Composition,” through Subsection 711.02.L, “Effective Performance Life.”

A. Composition

Uniformly distribute and firmly bond plastic materials, pigments, and glass beads on the top surface of retroreflective, preformed pavement marking film. Provide pre-coat preformed plastic film with a pressure-sensitive adhesive that is compatible with bituminous concrete and portland cement concrete road surfaces.

B. Skid Resistance

Ensure the retroreflective preformed film surface provides skid resistance value of at least 35 British Pendulum Number when tested in accordance with ASTM E 303.

C. Thickness

Provide a thickness from 0.06 in to 0.09 in [1.52 mm to 2.29 mm] for preformed plastic film, without adhesive, for lane and edge lines.

D. Tensile Strength and Elongation

Provide film with a tensile strength of at least 40 psi [275.8 kPa] of cross section when tested in accordance with ASTM D 638, except, test a 6 in × 1 in [152.4 mm × 25.4 mm] sample from 70 °F to 80 °F [21.1 °C to 26.7 °C] using a jaw speed from 10 in to 12 in [254 mm to 304.8 mm] per minute. Provide the sample with an elongation of at least 75 percent at break when tested by this method.

E. Conformability

Provide preformed film that conforms to pavement contours, breaks, and faults at normal pavement temperatures. Provide preformed plastic film that fuses with itself and previously applied marking film of the same composition.

F. Removability

Provide plastic striping tape that cannot be easily removed after application.

G. Adhesive

Provide plastic striping tape for longitudinal and transverse markings with pressure-sensitive backing without liner. Provide word and symbol tape with pressure-sensitive backing and protective liner.

H. Application Properties

Ensure the material adheres to asphalt concrete and portland cement concrete (PCC) surfaces when applied according to manufacturer’s recommendations at surface temperature of at least 65 °F [18.3 °C]. If applying the markings when the surface temperature is from 59 °F to 65 °F [10 °C to 18.3 °C], apply in accordance with the manufacturer’s recommendations, other special instructions, or both.

I. Glass Beads

Ensure the manufacturer incorporates glass beads for immediate and continuing retroreflection. Ensure the size, quality, and refractive index of the glass beads are such that
the beads perform in accordance with Subsection 711.02.K, “Reflectance.” Provide bead adhesion so beads are not easily removed when scratching the material surface with a thumbnail.

J. Pigmentation

Thoroughly blend color pigments to provide a pavement marking film that maintains uniform color under day and night lighting conditions throughout the expected life of the film. Provide white pavement marking film similar to Federal Standard Color No. 595-17886. Provide yellow pavement marking film similar to Federal Standard Color No. 595-13538.

K. Reflectance

Provide white and yellow films with an initial reflectance value at observation angles of 0.5° and 0.2°, and an 86° entrance angle, measured in accordance with the Federal Test Method 370. Ensure the specific luminance measured is in accordance with Table 711:4, “White and Yellow Film Reflective Properties,” and reported as milli-candelas per square foot per foot-candle (mcd/ft²/ftc) [milli-candelas per square meter per lux (mcd/m²/lx)]. Perform the test on a 24 in × 30 in [610 mm × 762 mm] sample from 50 ft [15.2 m] away.

Ensure the angular aperture of the photoreceptor and light projector is 6 min of arc. Ensure the reference center is the geometric center of the sample and is taken perpendicular to the test sample.

<table>
<thead>
<tr>
<th>Table 711:4</th>
<th>White and Yellow Film Reflective Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property</td>
<td>White</td>
</tr>
<tr>
<td>Observation angle, °</td>
<td>0.2</td>
</tr>
</tbody>
</table>

L. Effective Performance Life

Provide a film that leaves a neat, durable marking that will not flow or distort due to temperature if the pavement surface remains stable. Ensure the Authority, any state DOT, or the National Transportation Product Evaluation Program (NTPEP) qualifies the tape using a performance test of at least 12 months. Provide a pliant polymer that supplies a cushioned, resilient substrate that reduces bead crushing and loss. Provide weather resistant film that does not fade, lose, tear, roll back, or shrink throughout the marking life.

711.03 NON-REMOVABLE TEMPORARY PAVEMENT MARKING TAPE

A. General

Provide traffic striping material with a white or yellow weather and traffic resistant reflective film on a conformable backing pre-coated with a pressure-sensitive adhesive. Ensure the Authority, or any state DOT, qualifies the material through a performance test of at least 12 months.
Provide white or yellow retroreflective striping tape as required by the Contract. Ensure the tape reflects white or yellow respectively and is visible with automobile headlights at night.

Provide striping tape with a pre-coated, pressure-sensitive adhesive that does not require activation procedures or a liner to protect from contamination, pre-adhesion, and blocking.

Ensure the material adheres to asphalt concrete and PCC surfaces if applied in accordance with the manufacturer recommendations at surface temperatures of at least 35 °F [1.7 °C], and does not require protective devices.

B. Conformability

Provide thin, flexible, and formable striping material that conforms to the texture of the pavement surface after application.

Ensure the average thickness of the material, taken using five micrometer readings, is from 15 mil to 45 mil [381 µm to 1,143 µm].

C. Durability and Wear Resistance

Provide weather resistant striping material that will not fade, lift, or shrink.

D. Packaging

Provide striping material packaged in standard commercial containers to prevent damage during shipment and storage.

E. Storage

Provide striping material that will not deteriorate when stored for 1 year in temperatures no greater than 100 °F [37.8 °C].

F. Certification

Submit to the Engineer a Type D certification for the non-removable temporary pavement marking tape in accordance with Subsection 106.04, “Materials Certifications.”

711.04 REMOVABLE PAVEMENT MARKING TAPE

A. General

Provide removable pavement marking tape with a white or yellow all-weather, traffic-resistant film on a reinforced, conformable backing.

B. Adhesive

Provide removable, preformed pavement marking film pre-coated with a pressure-sensitive adhesive that is immediately ready for traffic after application. Ensure the film adheres to asphalt concrete and PCC surfaces without heat, solvents, additional adhesives, or activators. Provide adhesives that bond to pavement surfaces if applied at temperatures of at least 50 °F [10 °C] without pickup or distortion by vehicular traffic.
C. Color

Provide removable pavement marking tape in white or yellow that conforms to the standard highway color requirements of MUTCD as required by the Contract.

D. Glass Beads

Provide colorless glass beads with refraction index of at least 1.50 if tested using the liquid immersion method. Provide beads in the size and quantity that maintains retroreflectivity of the film as it wears through the surface course. Ensure the glass beads are uniformly distributed throughout the film for retroreflectivity.

E. Removability

Provide preformed pavement marking film that can be removed, intact or in large strips, from asphalt concrete and PCC surfaces. Ensure removal of the film is possible manually or with a mechanical roll-up device at temperatures above 50 °F [10 °C], and without heat, solvents, grinding, or sandblasting.

F. Durability

Provide film that leaves a neat, durable marking that will not flow or distort due to temperature. Ensure the Authority, or any state DOT, qualifies the material through a performance test of at least 6 months. Ensure the tape meets the removability requirements through the performance test in accordance with Subsection 711.04.E, "Removability." Provide weather resistant film that will not fade, lift, or shrink.

G. Certification

Submit to the Engineer a Type D certification for the removable pavement marking tape in accordance with Subsection 106.04, "Materials Certifications."

711.05 GLASS BEADS FOR TRAFFIC PAINT

A. Traffic Paint

Provide glass beads for traffic stripe paint in accordance with AASHTO M 247, Type I. Supply beads with a moisture-resistant coating.

B. Glass Beads for Thermoplastic

Provide drop-on glass beads in accordance with the following:

(1) Appearance

Provide colorless, clean and transparent glass traffic beads that are free of milkiness, excessive air bubbles, skins, and foreign material.

(2) Moisture

Provide glass traffic beads with no greater than 25 percent moisture by weight [mass].

(3) Refractive Index

Provide glass traffic beads with a refractive index of at least 1.5 when tested by the liquid immersion method at 77 °F [25 ºC].
(4) **Shape**

Provide spherically shaped glass traffic beads free of sharp, angular edges. Ensure the beads are free of scars and scratches.

(5) **Static Charge**

Provide glass traffic beads that do not create static electricity when flowing through a regular traffic bead dispenser.

(6) **Gradation**

Provide Oklahoma DOT Standard Glass Beads for Thermoplastic with a gradation in accordance with AASHTO M 247, Type I.

Provide Oklahoma DOT Large Glass Beads for Thermoplastic with a gradation in accordance with Table 711:5, “Large Glass Beads.”

<table>
<thead>
<tr>
<th>Table 711:5 Large Glass Beads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open U.S. Standard Sieves</td>
</tr>
<tr>
<td>No. 10</td>
</tr>
<tr>
<td>No. 12</td>
</tr>
<tr>
<td>No. 14</td>
</tr>
<tr>
<td>No. 16</td>
</tr>
<tr>
<td>No. 18</td>
</tr>
<tr>
<td>No. 20</td>
</tr>
<tr>
<td>Pan</td>
</tr>
</tbody>
</table>

(7) **Roundness**

Provide standard gradation glass beads that have at least 80 percent true spheres if tested in accordance with ASTM D 1155. Provide large gradation beads that have at least 80 percent true spheres. The manufacturer will provide a Type A certification for roundness with each shipment of large beads in accordance with Subsection 106.04, “Materials Certifications.”

(8) **Coatings**

Provide standard and large glass beads with an adhesion coating to promote adhesion in thermoplastic pavement marking material. Supply standard glass beads in accordance with AASHTO M 247, Type I with a moisture-resistant coating to prevent clumping.

**711.06 TRAFFIC STRIPE PAINT – ACRYLIC WATERBORNE**

Directly apply waterborne white and yellow traffic paint on asphalt concrete or PCC surfaces or existing traffic stripe composed of solvent based paint, waterborne paint, or thermoplastic compounds. Apply with spray equipment at application temperatures from 50 °F to 150 °F [10 °C to 66 °C]. Provide paint that receives and holds glass beads to produce reflectorized traffic markings.
A. Materials

Provide paint free of lead and chromium with a limited quantity of volatile organic compounds (VOC).

B. General

Provide finished paint formulated and manufactured from first-grade material listed in the Standard Formula. The Engineer must approve alternative materials before manufacture. Ensure the proposed materials equal the quality, composition, and the physical and chemical behavior of the materials on the Standard Formula after aging in the finished product.

C. Pigment

1. Titanium Dioxide

Provide titanium dioxide in accordance with ASTM D 476, Type II, Rutile. Ensure the hiding power of the titanium dioxide is at least equal to the standard sample if tested in the standard formula.

2. Pigment Yellow 65

Provide Yellow 65 pigment from Hoechst Celanese, Engelhard, Sun Chemical, or an equivalent approved by the Engineer.

3. Calcium Carbonate

Provide calcium carbonate in accordance with the ASTM D 1199, Type GC, Grade I, with at least 95 percent calcium carbonate and Type PC with at least 98 percent calcium carbonate.

D. Vehicle

1. Acrylic Emulsion Polymer

Provide Rohm and Haas E-3427 acrylic emulsion polymer, or an equivalent approved by the Engineer. Ensure the nonvolatile portion of the vehicle is composed of a 100 percent acrylic polymer and is at least 44 percent by weight [mass].

2. Methyl Alcohol

Provide methyl alcohol in accordance with ASTM D 1152 Specific Gravity, 20/20 °C, from 0.791 to 0.794.

3. Water

Provide potable water.

4. Miscellaneous Materials

Provide the miscellaneous materials in accordance with Table 711:6, “Miscellaneous Materials.”
Table 711:6
Miscellaneous Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispersant</td>
<td>Tamol 850</td>
</tr>
<tr>
<td>Surfactant</td>
<td>Triton CF-10</td>
</tr>
<tr>
<td>Defoamer</td>
<td>Foamaster 111</td>
</tr>
<tr>
<td>Hydroxy ethyl cellulose</td>
<td>Natrasol 250 HBR</td>
</tr>
<tr>
<td>Coalescent</td>
<td>Texanol</td>
</tr>
<tr>
<td>Preservative</td>
<td>Troy 192</td>
</tr>
</tbody>
</table>

E. Manufacture

Deliver ingredient materials in the original containers.

The manufacturer will provide the exact batch formula to manufacture the paint. The Authority will not allow changes to the formula without Engineer approval. The Engineer will not approve changes that adversely affect the quality or serviceability of the paint.

The Authority will use the standard formulas as specified in Table 711:7 as the basis for the paint. The Authority will not allow variations from the standard formula, except for the replacement of volatiles lost in processing or variations reviewed and approved by the Engineer.

Table 711:7
Standard Paint Formulas

<table>
<thead>
<tr>
<th>Material</th>
<th>White, lb [kg]</th>
<th>Yellow, lb [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.I. pigment, yellow 65 (Engelhard 1244)</td>
<td></td>
<td>32 [14.5]</td>
</tr>
<tr>
<td>Titanium dioxide, rutile, type T (Kerr McGee CR800)</td>
<td>100 [45.4]</td>
<td>21 [9.5]</td>
</tr>
<tr>
<td>Calcium carbonate, Type PC (Miss. M-60)</td>
<td>150 [68.0]</td>
<td>150 [68.0]</td>
</tr>
<tr>
<td>Calcium carbonate, Type GC (Hubercarb Q6)</td>
<td>430 [195.0]</td>
<td>465 [210.9]</td>
</tr>
<tr>
<td>Hydroxy ethyl cellulose, Natrasol 250HBR #</td>
<td>0.5 [0.2]</td>
<td>0.5 [0.2]</td>
</tr>
<tr>
<td>Acrylic emulsion, 50% solids (E2706)</td>
<td>541 [245.4]</td>
<td>535 [242.7]</td>
</tr>
<tr>
<td>Texanol (Eastman)</td>
<td>24 [10.9]</td>
<td>23 [10.4]</td>
</tr>
<tr>
<td>Defoamer (Colloids 654)</td>
<td>5 [2.3]</td>
<td>5 [2.3]</td>
</tr>
<tr>
<td>Dispersant (Tamol 850)</td>
<td>8 [3.6]</td>
<td>9 [4.1]</td>
</tr>
<tr>
<td>Surfactant (Triton CF10)</td>
<td>2 [0.9]</td>
<td>2 [0.9]</td>
</tr>
<tr>
<td>Preservative (Troy 192)</td>
<td>1.5 [0.7]</td>
<td>1.5 [0.7]</td>
</tr>
<tr>
<td>Water</td>
<td>10 [4.5]</td>
<td>10 [4.5]</td>
</tr>
<tr>
<td>Total</td>
<td>1,301 [590.1]</td>
<td>1,282 [581.8]</td>
</tr>
</tbody>
</table>

The Authority will allow the amount of hydroxy ethyl cellulose to vary up to 0.1 lb [0.05 kg] to adjust viscosity to desired range.

F. Mixed Paint

If the Engineer allows variations in materials, ensure the mixed paint equals the test results on a standard prepared from the standard formula and tested by the manufacturer under parallel conditions for the listed requirements.
Before filling, strain the paint with a screen no coarser than No. 40 mesh [425 µm] or a sieve meeting the Engineer’s approval.

Provide finished paint with no greater than 1.25 lb [150 g] of VOC per gallon [liter] of total non-volatile paint, in accordance with ASTM D 3960.

Provide paint in accordance with Subsection 711.06.F(1), “Pigment Composition,” through Subsection 711.06.F(15), “Dry Through Time.”

(1) **Pigment Composition**

Analyze the extracted pigment in accordance with Table 711:8, “Pigment Composition.”

<table>
<thead>
<tr>
<th>Material</th>
<th>White</th>
<th>Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic yellow (65%) a</td>
<td>—</td>
<td>4.8</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>≥13.4%</td>
<td>≥2.5%</td>
</tr>
<tr>
<td>Calcium carbonate</td>
<td>≤86%</td>
<td>≤93%</td>
</tr>
</tbody>
</table>

a To be determined by x-ray florescence, color spectrophotometry, or any other method the Authority may choose. This may be sent to an outside agency or organic pigment manufacturer. It also may include audit of the manufacturer’s invoices, batch tickets, inventory or other means determined by the Authority.

(2) **Physical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total solids by weight [mass]</td>
<td>≥73%</td>
</tr>
<tr>
<td>Volume solids</td>
<td>≥58%</td>
</tr>
<tr>
<td>Pigment by weight [mass]</td>
<td>49 – 54%</td>
</tr>
<tr>
<td>Vehicle by weight [mass]</td>
<td>46 – 51%</td>
</tr>
<tr>
<td>Non-volatile in vehicle by weight [mass]</td>
<td>≥44%</td>
</tr>
<tr>
<td>Weight [mass] per unit volume, from theoretical</td>
<td>≦0.3 lb/gal [±36 g/L]</td>
</tr>
<tr>
<td>Viscosity at 77 °F [25 °C]</td>
<td>83 KU – 98 KU</td>
</tr>
<tr>
<td>Grind (Hegman Gage)</td>
<td>≥3</td>
</tr>
<tr>
<td>Laboratory dry time, ASTM D 711</td>
<td>≤10 min</td>
</tr>
<tr>
<td>Dry through time</td>
<td>≤15 min of Standard Formula</td>
</tr>
</tbody>
</table>

(3) **Color**

Provide white paint that dries to a flat white color, is free of tint, and has opacity and visibility in both day and artificial light.

Provide yellow paint that matches Color Chip 33538 of Federal Standard 595 and is within 6 percent of the PR 1 chart central color when read over the black portion of a 2A Leneta Chart.

(4) **Flexibility**

Provide paint that is flexible and will not crack or flake if tested in accordance with Federal Specification TT-P-1952B.
(5) **Water Resistance**

Provide water resistant paint in accordance with Federal Specification TT-P-1952B. Ensure the paint does not blister, lose adhesion, soften, or deteriorate after the examination.

(6) **Freeze-Thaw Stability**

Provide freeze-thaw stable paint that does not coagulate, discolor, or change in viscosity greater than 10 KU if tested in accordance with Federal Specification TT-P-1952B.

(7) **Heat Stability**

Provide heat stable paint that does not coagulate, discolor, or change in viscosity greater than 10 KU if tested in accordance with Federal Specification TT-P-1952B.

(8) **Dilution Test**

Provide paint that can be diluted with water without curdling or precipitation so that wet paint can be cleaned with water.

(9) **Storage Stability**

Provide paint that will not cake, skin, thicken, curdle, or hard settle after 30 days in a closed container filled three-quarter full. Ensure the paint can be remixed to a smooth, homogeneous state. Ensure the viscosity does not differ from the original sample by greater than 5 KU.

Ensure the pigment will not settle or cake. Provide paint that will not skin, thicken, spoil, or change in consistency after nine months in storage from the packaging date.

Provide paint that can be re-dispersed with a paddle to a smooth, homogeneous condition.

(10) **Contrast Ratio**

Provide paint with a black/white contrast ratio of at least 0.98 if applied at a wet film thickness of 15 mil [381 µm] on a 2A Leneta Chart, or equivalent, and air dried for 24 hr. The Authority defines the contrast ratio as black over white.

(11) **Reflectance**

Ensure the daylight directional reflectance is at least 84 percent for white paint and at least 50 percent for yellow paint of a 15 mil [381 µm] wet film applied to a 2A Leneta Chart or an equivalent. After drying for 24 hr, use a Colorimeter and ASTM E 97 to measure the reflectance of the paint over the black portion of the chart.

(12) **Bleeding**

Provide paint with a bleeding ratio of at least 0.97 if tested in accordance with Federal Specifications TT-P-1952B. Provide asphalt-saturated felt in accordance with ASTM D 226, Type I.
(13) **Abrasion Resistance**

Provide at least 50 gal [190 L] of sand to remove paint film if tested in accordance with Federal Specification TT-P-1952B.

(14) **No-Tracking Time Field Test**

Dry the paint to a non-tracking condition in no greater than 3 min if applied at 17 mil ±1 mil [432 µm ±25 µm] wet film thickness plus 45 lb/ft³ [719 kg/m³] of glass beads at the specified application temperature. The Authority defines “no tracking” as the period when the line dries so a vehicle can run over the line at 40 mph [64 km/h] without tracking the reflectorized line when viewed from 50 ft [15 m] away.

(15) **Dry Through Time**

Apply the paint to a non-absorbent substrate at a wet film thickness from 17 mil ±1 mil [432 µm ±25 µm]. Place the paint in a humidity chamber controlled 90 ±5 percent relative humidity and from 72.5 °F ±2.5 °F [22.5 °C ±1.4 °C].

Determine the dry-through time in accordance with ASTM D 1640, except that the pressure exerted is the minimum amount to maintain contact with the thumb and film.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 724
BRIDGE BEARING STRUCTURAL STEEL
EOC-2465


724.05 BRIDGE BEARING ASSEMBLIES (Replace with the following):

A. Stainless Steel Bearing Assemblies

For bridge structure anchor plates, provide austenitic stainless steel plate in accordance with ASTM A 240, UNS Designation S31600 (Type 316) or S31603 (Type 316L). Charpy V-Notch (CVN) Impact Testing will not be required.

For bridge structure anchor bolts, provide continuously threaded austenitic stainless steel bars in accordance with ASTM A 320, Class 2, Grade B8M, UNS Designation S31600 (Type 316) or S31600 (Type 316L). As an option, anchor bolts manufactured from duplex stainless steel meeting the following requirements may be provided:

• Use Duplex (UNS S32304) solid stainless steel
• Provide 58ksi (400MPa) minimum yield strength when tested in accordance with the requirements of ASTM A276.
• Provide steel meeting the requirements of ASTM A276 and ASTM A955 from an ISO9001 certified manufacturing facility.
• Remove rolling scale from the surface of the duplex stainless steel bar by acid pickling.

Provide austenitic stainless steel nuts for anchor bolts in accordance with ASTM A 194, Grade 8M, Class 1. Charpy V-Notch (CVN) Impact Testing will not be required.

Provide austenitic stainless steel washers for anchor bolts in accordance with ASTM A 320, UNS Designation S31600 (Type 316) or S31600 (Type 316L). Charpy V-Notch (CVN) Impact Testing and strain hardening will not be required.

When welding stainless steel or welding to stainless steel, ensure all welding complies with ANSI/AASHTO/AWS D1.6, “Structural Welding Code - Stainless Steel,” and ensure the deposited weld metal has an atmospheric corrosion resistance and coloring characteristics similar to the base metal. Comply with the steel manufacturer’s recommendations, Table 724:5, and ANSI/AASHTO/AWS D1.6, “Structural Welding Code - Stainless Steel.”
Table 724:5
Filler Metal Specifications for Stainless Steel

<table>
<thead>
<tr>
<th>Filler Metal</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded metal arc welding (SMAW) electrodes</td>
<td>ANSI/AWS A5.4</td>
</tr>
<tr>
<td>Electrodes and fluxes for submerged arc welding (SAW)</td>
<td>ANSI/AWS A5.9</td>
</tr>
<tr>
<td>Electrodes for gas metal arc welding (GMAW)</td>
<td>ANSI/AWS A5.9</td>
</tr>
<tr>
<td>Electrodes for flux-cored arc welding (FCAW)</td>
<td>ANSI/AWS A5.22</td>
</tr>
</tbody>
</table>

Ensure electrodes and electrode-flux combinations are compatible with the type and thickness of the welded steel. Use electrodes and electrode-flux combinations with the type current, polarity, and positions in accordance with ANSI/AASHTO/AWS D1.6, “Structural Welding Code - Stainless Steel.”

B. Weathering Steel Bearing Assemblies

For bridge structure anchor plates, provide structural steel plate and angles in accordance with AASHTO M270 (ASTM A 709), Grade 50W. Charpy V-Notch (CVN) Impact Testing will not be required. Paint the structural steel anchor plates after all welding in accordance with Section 512. Use a category “N”, IZ-E-U paint system in accordance with subsection 512.04.B.(2). Coat all faying surfaces with inorganic zinc primer only. Apply the primer coat at the fabrication facility, and the intermediate and top coats at the project site.

For bridge structure anchor bolts, provide continuously threaded steel bars in accordance with AASHTO M 270 (ASTM A 709), Grade 50W. Charpy V-Notch (CVN) Impact Testing will not be required. Galvanize the anchor bolts in accordance with subsection 724.06.

Provide steel nuts for anchor bolts in accordance with AASHTO M 291 (ASTM A 563), Grade C3 or DH3. Galvanize the nuts in accordance with subsection 724.06.

Provide steel washers for anchor bolts in accordance with AASHTO M293 (ASTM F 436), Type 3, circular. Galvanize the washers in accordance with subsection 724.06.

Welding of weathering steel bearing assemblies will be in accordance with Section 724.03.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 733
ELASTOMERIC BEARING PADS
EOC-2465


733.06 ELASTOMERIC BEARING PADS (Replace with the following:)

A. Description

Provide plain and laminated elastomeric bearing pads for bearings used in, on, or under structural members with the dimensions and physical test parameters shown in the contract documents. Provide shop drawings to the Engineer for review and approval before beginning pad manufacture.

B. Materials

Provide materials, fabrication, fabrication tolerances, markings, certification testing, and installation for elastomeric bearing pads in accordance with AASHTO LRFD Bridge Construction Specifications. Provide low temperature grade elastomer compounds. Provide c in [3.2 mm] embedded laminate edge covers or connection members for steel reinforced bearing pads. Provide steel laminates in accordance with AASHTO M270 Grade 36 or ASTM A 1011 Grade 40. If the contract documents require the anchor plate to be bonded to the bearing pad, ensure a heat-bonded connection is made by the pad manufacturer during the vulcanization process. Ensure the steel anchor plate meets the requirements for the appropriate subsection of Section 724 and the contract documents before beginning the vulcanization process.

C. Testing and Acceptance

An elastomeric bearing pad is tested and accepted in one of two ways based on the manner in which the contract documents specify the pad.

(1) Testing with Shear Modulus

When the contract documents specify the elastomeric bearing pad by the Shear Modulus only or the Shear Modulus and Durometer Hardness, provide the bearing pad in accordance with AASHTO M251. When the Durometer Hardness is specified, ensure the Durometer Hardness meets the tolerances of AASHTO M251 appendix X1 for Hardness when tested in accordance with ASTM D 2240.

(2) Testing by Durometer

When the contract documents specify the elastomeric bearing pad by the Durometer Hardness only, provide the bearings pad in accordance with AASHTO M251 using Appendix X1 and ensure the Shear Modulus when tested in accordance with AASHTO M251 meets the requirements in Table 733:1
Table 733:1
Shear Modulus for Durometer Hardness

<table>
<thead>
<tr>
<th>Durometer Hardness</th>
<th>Shear Modulus, psi [Mpa], minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>110 [0.76]</td>
</tr>
<tr>
<td>60</td>
<td>150 [1.03]</td>
</tr>
<tr>
<td>70</td>
<td>235 [1.62]</td>
</tr>
</tbody>
</table>

(3) Acceptance

The Engineer will accept elastomeric bearing pads in accordance with the following:

- Submit to the Engineer a Type A certification showing compliance with the contract requirements.
- Submit to the Engineer one full-size finished bearing pad per lot, size, type or shipment, for physical testing by the Department’s Materials Division or its representative. The Department’s Materials Division may conduct on-site inspection of bearing pads for slab bridges or other pads deemed by the Materials Engineer to be too cumbersome for submission to the laboratory.
- Upon test completion, approved bearing pads may be collected by the contractor or the pad manufacturer from the Department’s Materials Laboratory or its representatives test facility. The Department will not return failed bearing pads.

856.02 MATERIALS

A. Physical Properties of the Mixed Compound

(Replace Table 856:1 with the following:)

<table>
<thead>
<tr>
<th>Federal 595 Color</th>
<th>Color Requirements</th>
<th>Chromaticity Coordinates</th>
<th>Brightness (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>White</td>
<td>17886</td>
<td>0.355</td>
<td>0.355</td>
</tr>
<tr>
<td>Yellow</td>
<td>13538</td>
<td>0.560</td>
<td>0.440</td>
</tr>
</tbody>
</table>

B. Multi-Polymer Composition

(Replace Table 856:4 with the following:)

<table>
<thead>
<tr>
<th>Pigment Composition</th>
<th>MultiPolymer Composition</th>
<th>Percent by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>White:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide Rutile (94% minimum purity, ASTM D 476, Type III)</td>
<td>33 – 38</td>
<td></td>
</tr>
<tr>
<td>Multi-Polymer Resin</td>
<td>60.0 – 82.0</td>
<td></td>
</tr>
<tr>
<td>Yellow:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Non-Lead Yellow</td>
<td>7.0 – 8.0</td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide (ASTM D 476, Type III)</td>
<td>14.0 – 17.0</td>
<td></td>
</tr>
<tr>
<td>Multi-Polymer Resin</td>
<td>77.0 – 79.0</td>
<td></td>
</tr>
</tbody>
</table>
C. Sampling and Certification (Replace with the following:)

Submit a Type A certification to the Authority for each batch of stripe used on every project along with the Pretest Report for the glass beads.

- The Engineer may require a 1 qt sample representing each batch of multi-polymer resin material be submitted to the Authority.
- Ensure the manufacturer’s multi-polymer striping is listed on the Oklahoma Department of Transportation (ODOT) Traffic Engineering Division’s Qualified Products List (QPL).
- If the manufacturer makes any formulation changes to the multi-polymer striping material, ensure the manufacturer submits a written explanation of the changes to the formulation, the new physical and chemical properties for the resin, and a new MSDS for the stripe to the Authority for re-evaluation and approval at least 30 days prior to its use.

D. Non-Reflectorized Contrast or Shadow Markings (Replace with the following:)

Ensure the marking material used for the contrast or shadow marking conforms to the same formulation, material, and pre-approved sampling requirements, except for the following items:

- Color pigments used,
- Color requirements listed, and
- Use 24 lb per 100 ft² min [10.8 kg per 10 m²] of a black, color-fast, medium mesh, anti-skid material.

856.03 EQUIPMENT (Add the following:)

Use equipment fitted with a functional data logging system equipment listed on the Oklahoma Department of Transportation’s qualified products list (http://www.okladot.state.ok.us/traffic/qpl/index.php). Ensure the data logging system is operational, calibrated, and in use prior to striping operations. Provide the Engineer with a certification that the data logging system equipment meets the manufacturer’s recommended calibration, along with the manufacturer’s recommendations for equipment calibration frequency.

856.04 CONSTRUCTION METHODS

A. Surface Preparation

Remove foreign material from the road surface before applying the dual component material. Ensure the pavement surface is dry.

Use abrasive blasting, grinding, or high-pressure water jet to remove existing, temporary, or permanent traffic markings until at least 95 percent of the underlying pavement is visible, unless otherwise specified by the manufacturer. Minimize interference between temporary pavement markings and the permanent dual-component pavement marking materials.

Remove the curing compound at least 1 in [25 mm] beyond the width of the marking. After removing the curing compound, sweep and use a high-pressure air spray.

B. Pavement Temperature and Condition (Replace with the following:)

NOT FOR CONSTRUCTION
Apply dual component pavement markings to Portland cement concrete pavement surfaces at least 30 calendar days after paving, and new asphalt concrete pavement a minimum of 3 calendar days after paving under the following conditions:

- On a dry roadway (no standing water or significant dampness)
- At a pavement surface temperature of at least 40 °F [4.4 °C] and rising; and
- At wind chill temperature of at least 35 °F [1.7 °C].

Measure the pavement surface temperatures 30 min before beginning striping installation. If critical temperatures exist, as determined by the Engineer, measure the pavement surface temperature every 1 hr to 2 hr, or at shorter intervals as directed by the Engineer, until the end of the day. Measure the pavement surface temperature with a standard surface temperature or infrared non-contact thermometer.

In the event that temperatures and conditions are not conducive to the installation of permanent pavement marking within the specified time frame, including time for curing of PC pavement, the Engineer may allow and accept the installation of temporary pavement marking in lieu of permanent markings at no additional cost to the Authority until such time as the permanent markings can be installed. Maintain the temporary markings until temperatures and conditions are conducive for permanent striping. Furthermore, the Authority may suspend the contract and/or milestone time until temperatures and/or conditions improve such that the permanent markings can be placed. In order for time suspension to be considered all contract work which is unaffected by the inability to place the permanent paving markings must be completed.

C. Application (Replace with the following):

Apply large glass beads at a coverage rate of at least 12 lb per 100 ft² [5.4 kg per 10 m²] before applying standard beads. Apply standard glass beads at a coverage rate of at least 12 lb per 100 ft² [5.4 kg per 10 m²]. For hand-machine applied markings, apply large glass beads at a coverage rate of at least 12 lb per 100 ft² [5.4 kg per 10 m²] before applying standard beads. Apply standard glass beads at a coverage rate of at least 12 lb per 100 ft² [5.4 kg per 10 m²].

Alternatively, for Portland cement concrete pavement apply a non-reflectorized contrast marking, of the same dimensions as the white skip lines shown on the Plans, immediately after each upstream white skip line.

For Portland cement concrete pavements ensure the traffic stripe is a minimum thickness of 20 mils. For asphalt concrete pavements ensure the traffic stripe is a minimum thickness of 25 mils.

Use a computerized data logging system for monitoring the application of multi-polymer stripe to measure the thickness of the multi-polymer stripe. Collect data for any pavement marking application of 1,000 linear feet or greater. Report the following data as an average for each 1,000 feet:

- Application speed to the nearest 0.1 mph
- Weight (lbs) and/or volume (gallons as measured through a piston displacement pump mechanism) amount of material used by color
- Weight (lbs) of glass beads/elements used
- Pavement surface temperature (°F)
- Air temperature (°F)
- Dew point (°F)
• Humidity (%)
• Material application rates and film thickness over section painted.

In addition to the above data, record the highway number with the beginning and ending reference point rounded to the nearest hundredth of a mile, project number, and job piece number.

Provide an electronic or printed record of the data to the Engineer daily. The Engineer may determine that more frequent submission is necessary, particularly if equipment malfunctions occur. Produce either the printed or electronic records in their final form prior to the records being removed from the striping equipment (i.e. the Contractor presents this to the Engineer in the field). If only one record is produced at the striping equipment, the other maybe produced in an office. However, present the first record to the Engineer prior to any of the data entering an office environment. Ensure the electronic record is a comma or space delimited text file, adequate for insertion into a computerized spreadsheet software package, or a spreadsheet format acceptable to the Engineer.

Provide the Engineer the above records for all longitudinal non-handwork line painted.

Prior to the start of striping operations, travel a distance of 100 ft. to verify the consistency of physical and electronic measurements of distance traveled.

Ensure longitudinal and edge line markings meet the minimum mil thickness values in accordance with Table 856:5 for concrete pavement, and Table 856:6 for asphalt pavement:

### Table 856:5
#### Minimum Mil Thickness

<table>
<thead>
<tr>
<th>PCC Pavement</th>
<th>Contract unit price adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥20</td>
<td>100%</td>
</tr>
<tr>
<td>19 - 18</td>
<td>90%</td>
</tr>
<tr>
<td>17 - 16</td>
<td>75%</td>
</tr>
<tr>
<td>15 - 14</td>
<td>50%</td>
</tr>
<tr>
<td>&lt; 14</td>
<td>Remove and replace</td>
</tr>
</tbody>
</table>

### Table 856:6
#### Minimum Mil Thickness

<table>
<thead>
<tr>
<th>AC Pavement</th>
<th>Contract unit price adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥25</td>
<td>100%</td>
</tr>
<tr>
<td>24 - 23</td>
<td>90%</td>
</tr>
<tr>
<td>22 - 21</td>
<td>75%</td>
</tr>
<tr>
<td>20 - 19</td>
<td>50%</td>
</tr>
<tr>
<td>&lt; 19</td>
<td>Remove and replace</td>
</tr>
</tbody>
</table>
D. Performance Period *(Replace with the following:)*

Ensure markings and replacement markings meet the Contract requirements for at least one (1) calendar year from the beginning of the warranty period. Within 45 calendar days of notification by the Engineer, remove and replace non-compliant pavement markings at no additional cost to the Authority.

E. Retroreflectivity *(Replace with the following:)*

Measure stripes with a portable reflectometer that uses 30 m geometry in accordance with ASTM E 1710 and the manufacturer recommendations. Ensure the manufacturer calibrates the reflectometer annually. Keep the annual calibration certification with the reflectometer. All reflectometer readings must be in conjunction with line thickness gauge measurements.

1) Minimum Retroreflectivity

Ensure longitudinal markings on Portland cement concrete and asphalt concrete pavement surfaces meet the minimum retroreflectivity values in accordance with Table 856:7 and 856:8.

(2) Measurement

Measure retroreflectivity of markings within 7 to 21 calendar days of placement, after removing loose beads.

Measure marking retroreflectivity in the direction of traffic, except the Authority will allow yellow skip stripes to be measured in either direction of travel. One measurement (multiple readings) will represent each 2,500 ft [762 m] lot of single-color longitudinal stripe. The Authority will not allow readings for adjacent lots to be taken closer than 1,000 ft [305 m] from each other.

For solid longitudinal stripes, one measurement represents the average of five readings per lot, taken at 3 ft [1 m] intervals along a randomly selected 15 ft [4.5 m] section of solid stripe.

For longitudinal skip stripes, one measurement represents the average of six readings per lot, two readings taken from each of three adjacent skip stripes. The Authority will not allow readings taken within the first or last 1 ft [0.3 m] of skip stripes.

For non-compliant measurements, the Engineer will require additional measurements to determine the extent of non-compliance.

The Authority will not require measurements of the following:

- Stop-bars, crosswalks, gores, words, symbols;
- Longitudinal striping installed using hand line machines;
- Projects no greater than 1 mi [1.6 km] long.

Obtain the Engineer’s approval in writing before using a mobile retroreflectometer system as an alternative measurement method.
(3) Acceptance

(Replace Table 856:6 with the following:)

<table>
<thead>
<tr>
<th>Table 856:7</th>
<th>Minimum Retro-reflectivity (PC Pavement)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
</tr>
<tr>
<td>mcd/m²/lx</td>
<td></td>
</tr>
<tr>
<td>≥500 *</td>
<td></td>
</tr>
<tr>
<td>450-499 *</td>
<td></td>
</tr>
<tr>
<td>300-449 *</td>
<td></td>
</tr>
<tr>
<td>&lt;300</td>
<td></td>
</tr>
<tr>
<td>≥325 *</td>
<td></td>
</tr>
<tr>
<td>275-324 *</td>
<td></td>
</tr>
<tr>
<td>225-274 *</td>
<td></td>
</tr>
<tr>
<td>&lt;225</td>
<td></td>
</tr>
</tbody>
</table>

*The Contractor has the option to replace the stripe at no additional cost to the Authority, or take the deduction.

(Add the following:)

<table>
<thead>
<tr>
<th>Table 856:8</th>
<th>Minimum Retro-reflectivity (AC Pavement)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
</tr>
<tr>
<td>mcd/m²/lx</td>
<td></td>
</tr>
<tr>
<td>≥400 *</td>
<td></td>
</tr>
<tr>
<td>350-399 *</td>
<td></td>
</tr>
<tr>
<td>200-349 *</td>
<td></td>
</tr>
<tr>
<td>&lt;200</td>
<td></td>
</tr>
<tr>
<td>≥250 *</td>
<td></td>
</tr>
<tr>
<td>225-249 *</td>
<td></td>
</tr>
<tr>
<td>175-224 *</td>
<td></td>
</tr>
</tbody>
</table>

* The Contractor has the option to replace the stripe at no additional cost to the Authority, or take the deduction.

856.05 BASIS OF PAYMENT

(Replace the second paragraph with the following:)

The Authority will consider the cost of preparing the pavement to be included in the contract unit price for the relevant pay item.
AUTHORITY
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISIONS
FOR
SECTION 857
CONSTRUCTION ZONE PAVEMENT MARKINGS
EOC-2465


857.01 DESCRIPTION (Add the following:)

This work consists of removing pavement markings along with other debris from asphalt concrete and Portland cement concrete pavement surfaces.

857.02 MATERIALS (Add the following:)

Provide potable water. Lake or river water will not be allowed. Use of chemicals, abrasives materials, grinders, detergents or salt water will not be allowed.

857.04 EQUIPMENT (Revise as follows:)

A. General

Apply pavement markings in accordance with the manufacturer’s recommendations. Use a paint machine and bead dispenser in accordance with Subsection 854.03, “Equipment,” to apply the painted construction traffic stripe. Use equipment for removing pavement markings that will not damage the pavement surface or pavement material texture.

(Add the following:)

B. Hydroblasting Equipment

Use cleaning or pavement marking removal equipment capable of removing 100% of the pavement marking using high-pressure water. Ensure the equipment is capable of maintaining 36,000 psi water pressure at a maximum flow rate of 16 gpm. Provide a self-propelled vehicle with all functions programmable and repeatable for long lines of road marking removal. The removal head must be capable of rotating at a minimum of 1,500 rpm. Ensure the equipment is capable of removing a minimum of 1,200 linear feet of 4 inch strip per hour.

Use trolley mounted water jetting equipment to remove pavement markings in areas inaccessible to the truck mounted equipment to remove pavement markings in areas inaccessible to the truck mounted equipment such as hatched areas, words, arrows and symbols. Ensure the equipment is capable of maintaining 36,000 psi water pressure. The removal head must be capable of rotating at a minimum of 1,500 rpm.

Use equipment capable of removing the traffic strip from the surface, including cracks, to thoroughly remove all dust, dirt, and other foreign materials without causing damage to the
surface by etching or exposing coarse aggregate. Use a wet vacuum in conjunction with the removal head to remove all debris to a secure holding tank on the truck. After removal of the pavement markings leave the surface clean and ready to accept the new road marking once drying has occurred.

Operate all equipment in the same direction as traffic flow.

Ensure all equipment meets applicable OSHA requirements.

**857.04 CONSTRUCTION METHODS**

**D. Removal (Replace with the following : )**

If a detour or permanent pavement markings conflict with the pavement markings of the next traffic control phase, remove as approved by the Engineer before switching traffic. Remove existing pavement markings and replace with temporary markings before roadway opens to traffic. Remove temporary pavement markings before installing final striping.

When additional pavement marking is necessary due to overlays, redirection of traffic, restoration, or Engineer direction, start the pavement marking within 24 hours of notification from the Engineer.

Remove the removable pavement marking and adhesive, as directed by the Engineer. Install additional pavement markings according to traffic conditions, as approved by the Engineer. Immediately dispose of removed pavement marking tape and pavement markers.

Remove pavement markings without damaging the pavement surface, or pavement material texture. Pavement material texture will be considered damaged if more than 5 mils are removed below the original strip. Repair pavement damage as directed by the Engineer at no additional cost to the Authority.

The Authority will not allow painting over or blotting out the existing pavement markings. When removing pavement markings, immediately remove the residue using a vacuum attachment operated concurrently with the operation, or by other methods approved by the Engineer.

When the method of Hydro-blasting is utilized, the work shall be performed at locations shown on the plans or as directed by the Engineer. Remove 100% of the pavement marking deposits using ultra-high pressure water jets without damaging the road surface. Repair any damage to the pavement surface caused by the Contractor’s operation at no additional cost to the Authority. Obtain the Engineer’s approval of the proposed method of repair prior to performing the repair.

Operation of the ultra-high pressure water jets shall be performed and supervised by qualified personnel certified by the equipment manufacturer. Do not perform work unless the ambient temperature and pavement temperature is a minimum of 40 degree Fahrenheit.
Use collection systems to prevent the escape of debris. If spills or releases occur, immediately cease operations, clean up the debris, and take appropriate corrective actions to prevent similar releases from occurring.

Properly dispose of wastes generated during the pavement marking removal, in compliance with all applicable federal, state and local laws, regulations, and rules.

Ensure the work site is clear of visible debris at the end of each work day.

857.05 METHOD OF MEASUREMENT (Add the following:)

Pavement Marking Removal (Traffic Stripe) will be measured by linear foot of four inch wide traffic stripe where a narrower or wider stripe is to be removed, that is, prorated to a four inch strip. Count each unit of arrows, words or symbols to be removed.

(Add the following:)

871.01 DESCRIPTION

This work consists of providing construction zone impact attenuators.

871.02 MATERIAL

Provide construction zone impact attenuators meeting NCHRP 350 test level III requirements.

871.04 CONSTRUCTION METHODS

Install impact attenuators as specified in the plans, and in accordance with the manufacturer’s recommendations.

871.05 METHOD OF MEASUREMENT

The Engineer will measure Construction Zone Impact Attenuator by the sign day.

871.06 BASIS OF PAYMENT

The Authority will pay for each pay item at the contract unit price per the specified pay unit as follows:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(B) CONSTRUCTION ZONE IMPACT ATTENUATOR</td>
<td>SD</td>
</tr>
</tbody>
</table>

CONSTRUCTION ZONE IMPACT ATTENUATORS

SP 871 - 1 of 1

(Add the following:)

### 878.01 DESCRIPTION

This work consists of providing and installing modular glare screen units on concrete median barriers.

### 878.02 MATERIALS

Provide 10 ft [3 m] long modular glare screen units with glare screen blades, a flexible base rail, mounting brackets with hardware, and an anchor bolt system.

Provide modular glare screen blades and base rail manufactured from frangible or flexible light-weight material. Provide modular glare screen in accordance with Table 878:1, “Modular Glare Screen Blade Properties.”

<table>
<thead>
<tr>
<th>Table 878:1</th>
<th>Modular Glare Screen Blade Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property</td>
<td>Measurement</td>
</tr>
<tr>
<td>Weight</td>
<td>≤0.9 lb/ft [1.30 kg/m]</td>
</tr>
<tr>
<td>Width</td>
<td>4½ in – 6 in [115 mm – 150 mm]</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>0.90 – 1.70</td>
</tr>
<tr>
<td>Tensile strength</td>
<td>≥2,900 psi [20,000 kPa]</td>
</tr>
</tbody>
</table>

Provide green modular glare screen blades similar to Federal Standard Number 595-34227.

#### A. Base Rail

Provide base rail in accordance with Table 878:2, “Base Rail Properties.”

<table>
<thead>
<tr>
<th>Table 878:2</th>
<th>Base Rail Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property</td>
<td>Measurement</td>
</tr>
<tr>
<td>Weight</td>
<td>≤1.4 lb/ft [2.00 kg/m]</td>
</tr>
<tr>
<td>Width</td>
<td>4½ in [115 mm] – 6 in [150 mm]</td>
</tr>
<tr>
<td>Rail tensile strength</td>
<td>≥2,900 psi [20,000 kPa]</td>
</tr>
</tbody>
</table>

#### B. Weatherability

Provide glare screen blades and base rails that retain mechanical properties from −40 °F to 150 °F [−40 °C to 65 °C] and show minimum degradation after 3,000 hr in a weatherometer.
C. Certification

Submit to the Engineer a Type D materials certification in accordance with Section 106.04, “Material Certifications.”

878.03 EQUIPMENT — VACANT

878.04 CONSTRUCTION METHODS

Install unit component parts as shown on the Plans and in accordance with the manufacturer’s recommendations.

Fasten each base rail section to the barrier wall in at least three locations. Ensure the connections have a pullout strength of at least 2,900 psi [20,000 kPa] and a shear strength of at least 2,900 psi [20,000 kPa].

878.05 METHOD OF MEASUREMENT — VACANT

878.06 BASIS OF PAYMENT

The Authority will pay for each pay item at the contract unit price per the specified pay unit as follows:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) MODULAR GLARE SCREEN (PERMANENT)</td>
<td>Each or Linear Foot [Meter]</td>
</tr>
<tr>
<td>(C) MODULAR GLARE SCREEN (TEMPORARY)</td>
<td>Sign Day</td>
</tr>
</tbody>
</table>

(Add the following:)

880.01 DESCRIPTION

This work consists of providing, erecting, and maintaining signs, lights, barricades, and other traffic control devices which are used for the purpose of warning, regulating, directing or otherwise controlling the flow of traffic through a construction contract.

880.02 MATERIALS

A. Construction Signing and Traffic Control Materials

Provide materials for construction signing and traffic control in accordance with NCHRP 350 report Test Level III, approved by FHWA.

(1) Arrow Display

Provide each arrow display with a circuitry control unit, a mounting frame, and a sign panel with yellow sealed beam lamps attached in accordance with MUTCD Section 6F-3.

Provide non-reflective black finish for panel faces exposed to oncoming traffic.

Provide a control unit to display higher intensity during the day and lower intensity at night. Ensure lamps display the same light intensity for a given setting. The Authority will only allow the substitution of larger panels for smaller panels.

Provide a mounting frame to support the sign panel so the bottom edge of the panel is at least 7 ft [2.1 m] above the roadway surface when displayed to oncoming traffic. Mount arrow displays so the panel rotates on a horizontal axis to hide it from the view of oncoming traffic when not in use. Mount mobile arrow displays on pneumatic-tired vehicles.

Provide a power source with a separate auxiliary power source that can be immediately available to operate flashing lights. Provide a self-contained battery or electric generator power source on mobile arrow displays.

Provide arrow displays with a solid-state electronic circuitry control unit with four modes that contain switching controls for operator selection in accordance with Table 880:1, “Arrow Display Controls.”
Table 880:1
Arrow Display Controls

<table>
<thead>
<tr>
<th>Mode</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass Right</td>
<td>Flasing arrow</td>
</tr>
<tr>
<td>Pass Left</td>
<td>Flasing arrow</td>
</tr>
<tr>
<td>Pass either side</td>
<td>The apex of the outermost chevrons point to</td>
</tr>
<tr>
<td>Caution</td>
<td>the nearest panel edge.</td>
</tr>
<tr>
<td></td>
<td>At least four lamps in a pattern not</td>
</tr>
<tr>
<td></td>
<td>indicating a direction.</td>
</tr>
</tbody>
</table>

(2) Construction Signs and Barricades

Provide metal, wood, or plastic supports and sign blanks. Provide two supporting legs for each sign 10 ft² [1 m²] or larger. Provide wide-angle flat-top retro-reflective sheeting for signs and barricades in accordance with Type IV-A sheeting, unless otherwise shown on the Plans.

Construct sign messages and symbols in accordance with MUTCD and as shown on the Plans.

Mark and immediately replace construction signs not in accordance with Subsection 719.04, “Retroreflective Sheeting.”

(3) Construction Signs 32.3 ft² [3 m²] and Larger

Provide aluminum or galvanized steel to construct signs. If ground mounting, provide and install breakaway signs in accordance with GMS-1, FGS-1, FGS-2, and SPA-1. The Engineer will approve installation locations before construction begins. The Authority will not require reinforcing steel in the sign footings. Place signs on existing overhead signs if shown on the Plans.

Retro-reflectorize signs as required by the Contract. Provide signs of the designs and colors shown on the Plans.

(4) Vertical Panels

Provide vertical panels in accordance with MUTCD Section 6F-5. Place Type IV-A reflectorized sheeting on both sides of each vertical panel.

(5) Warning Lights

Provide warning lights in accordance with MUTCD Section 6F-7OF.

(6) Cones

Provide cones in accordance with MUTCD Section 6F-5.

(7) Flagger

If required by the Contract, provide two flaggers per sign day. Provide lighting to illuminate the flagger stations at night.

(8) Plastic Drums

Provide two-piece breakaway drums in accordance with the MUTCD. The drums must accommodate conventional barricade warning lights that are in accordance with the NCHRP 350, Category I device requirements. These drums will be used as channelizing devices for construction and maintenance operations.
Provide plastic drums at least 36 in [900 mm] high and at least 18 in [450 mm] wide regardless of orientation. The plastic drum must be capable of withstanding 60 mph [100 km/h] winds, turbulence created by vehicles, and repeated movements during construction and maintenance operations. Ensure the top portion of the unit deforms and breaks away from the base upon vehicular impact. Ensure the base remains in place, allowing the vehicle to pass over it. Ensure the base weighs at least 40 lb, and the outside edge does not exceed 4 in [100 mm]. Provide rubber base collars that are clean cut, the proper size, black in color, and not curved at the top edges. Ensure the maximum diameter of the base does not exceed 36 in [900 mm].

Provide bright orange plastic drums that resist color fading. Ensure the plastic drum is crash worthy in accordance with the NCHRP 350. Ensure sheeting surfaces provide maximum adhesion of reflective sheeting to the drum body.

Provide weather tight drums designed to accept horizontal circumferential bands of reflectorized sheeting, 4 in to 6 in [100 mm to 150 mm] wide. Provide drums with a D-shaped configuration at the base attachment point to minimize rolling after impact. Provide drums with enclosed tops, and drains to prevent water accumulation. Ensure that stacking the drums will not damage the reflective surface. Ensure each drum allows the attachment of two Type A or Type C conventional barricade warning lights. Provide warning lights capable of remaining attached during repeated impacts at speeds of at least 55 mph [88 km/h] and in accordance with NCHRP 350.

Provide drums that have alternating fluorescent orange and white horizontal circumferential stripes of retro-reflectorized sheeting. Ensure there shall be a minimum of two fluorescent orange and two white stripes, beginning with a fluorescent orange stripe at the top of the drum. If there are non-reflectorized spaces between the horizontal orange and white stripes, ensure they are no more than 2 in [50 mm] wide. Ensure the non-reflectorized portions of the drum are orange. Provide reflective sheeting that meets the requirements of the latest ASTM D4956, and the Federal Highway Administration Luminance Factor for fluorescent orange, Type VI reboundable sheeting (see Table 880:2).

<table>
<thead>
<tr>
<th>Table 880:2</th>
<th>Luminance Factor, Y_T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheeting Type</td>
<td>Min</td>
</tr>
<tr>
<td>Fluorescent Orange</td>
<td>25</td>
</tr>
</tbody>
</table>

(9) Tube Channelizers

Provide orange tube channelizers, at least 27 in [700 mm] high and at least 2 in [50 mm] wide when facing traffic. Ensure the channelizers do not damage vehicles upon impact.
For nighttime use, equip each tube channelizer with two 3 in [75 mm] wide white bands with retroreflectivity at least that of Type IV sheeting. Place the white bands no greater than 2 in [50 mm] from the top of the tube and no greater than 6 in [150 mm] apart.

(10) **Sampling and Testing**

Submit to the Engineer a Type D certification in accordance with Subsection 106.04, “Materials Certifications.”

(11) **Temporary Roadway Lighting Assembly**

Provide temporary roadway lighting assemblies of the type specified, meeting the material requirements of applicable subsections of these specifications. Include all of the following items, unless otherwise specified:

- 2/C or 3/C No. 4 ACSR electric conductor (aerial), between the lighting poles and to the temporary service pole.
- 1/C No. 12 electric conductor, to the luminaries.
- In-line fuse connector with a 15 amp. Fuse. (Optional)
- An existing or new permanently installed roadway pole with either one or two luminaires may be considered a temporary roadway lighting assembly for payment as outlined in Section 880.05.

Provide the following specific items for the various assembly types:

**Assembly Type 40**
- 40' (12.2 m) Class 6 wood pole with an 8' (2.4 m) galv. steel mast arm
- 250 watt high pressure sodium roadway luminaire rated at 27,000 lumen, Type M-S-III

**Assembly Type 55**
- 55' (16.8 m) Class 4 wood pole with a 10' (3.0 m) galv. steel mast arm.
- 400 watt high pressure sodium roadway luminaire rated at 50,000 lumen, Type M-S-III

(12) **Temporary Service Pole Assembly**

Provide temporary service pole assemblies meeting the material requirements of applicable subsections of these specifications. Include all of the following items, unless otherwise specified:

- 35' (10.7 m) Class 6 wood pole
- 60 or 100 amp. , 2-pole lighting controller
- 60 or 100 amp. disconnect switch
• Miscellaneous equipment including PE cell, conduit, electrical conductors, fuses, connectors and meter base, if required

880.03 EQUIPMENT — VACANT

880.04 CONSTRUCTION METHODS

Perform construction traffic control as directed by the Engineer in accordance with MUTCD Chapter VI and as shown on the Plans.

Place signs, lights, and barricades on portable or fixed supports as required by the Contract.

Monitor and maintain the condition of devices. Immediately clean, degrease, or replace damaged signs and devices as directed by the Engineer. All devices used must meet reflectivity requirements in accordance with MUTCD and as directed by the Engineer at all times.

Coordinate with Authority personnel to conduct nighttime traffic control device reviews at the beginning of the Project, in conjunction with major changes to traffic signing, and at monthly intervals. Record the date and result of the nighttime inspection in the contractor signing log.

Immediately remove or cover unnecessary traffic control devices as approved by the Engineer.

Light the flagger stations at night and ensure the lighting does not impede the vision of passing drivers.

The Engineer will give written notice of unacceptable conditions to facilitate prompt maintenance and changes in construction traffic control devices. The Engineer shall be the sole judge as to whether the unacceptable condition constitutes an immediate safety hazard to the travelling public or construction workers.

Dispatch sufficient resources within two (2) hours of notification by the Engineer to perform needed corrections to the unacceptable conditions that constitute an immediate safety hazard. Other unacceptable conditions identified by the Engineer shall be corrected within 12 hours of notification by the Engineer.

Failure to restore the required traffic control devices and protection within the time limits specified above will result in a non-recoverable, daily monetary deduction for each 24-hour period (or portion thereof) the deficiency remains. The time period will begin with the time of notification to the Contractor and end once the Engineer has accepted the correction. The deduction will be applied at the rate of $2,500 per day or 0.05 percent (0.05%) of the awarded contract value, whichever is greater.

If the Contractor continually fails to correct the unacceptable condition, the Engineer may perform the corrections and the cost thereof will be deducted from the monies due or which may become due the Contractor. This corrective action will in no way relieve the Contractor of the contractual requirements of responsibilities or associated penalties.

Existing general roadway illumination shall not relieve the Contractor of his responsibility for furnishing and maintaining any of the traffic control devices specified.

Maintain continuous surveillance and continuously realign and relocate all traffic control devices displaced by wind, traffic, Contractor operations, or any other cause. Provide additional
personnel and equipment to maintain all traffic control devices during inclement weather conditions.

Continue providing construction traffic control and maintain the log of devices until completion and acceptance at no additional cost to the Authority.

Install the temporary roadway lighting assembly and temporary service pole assembly at the direction of the Engineer, and in cooperation with the local utility company and the local governmental agency. Repair any damage to the temporary roadway lighting assembly and/or temporary service pole assembly inflicted during the installation, relocation, and/or removal of these items at no additional cost to the Authority.

Install Assembly Type 40 on two-lane and three-lane roadways. Install Assembly Type 50 on roadways with more than three lanes.

The suggested maximum spacing between temporary lighting poles is 150' to 170' (45.7 m to 51.8 m) for Assembly Type 40, and 180' to 210' (54.9 m to 64 m) for Assembly Type 55. Connect the temporary lighting poles to electrical power at a temporary service pole using aerial conductors. Using portable median barrier, protect the temporary light poles and service pole assemblies from the traffic flow in a manner approved by the Engineer.

Operate temporary roadway lighting at 480 volts.

880.05 METHOD OF MEASUREMENT

A. Per Pay Item

If Plans show itemized pay items for construction traffic control devices, the Engineer will measure each device used for construction traffic control per calendar day. For non-working periods, the Engineer will use the sign log from the previous and successive working days to measure payment for devices. The Engineer will measure one calendar day for devices used at multiple locations in one day.

Maintain a log of devices used for construction traffic control per calendar day. Update the log daily throughout the project to confirm the addition or deletion of individual devices. Submit the log to the Engineer before each pay period.

The Authority will not allow unnecessary devices to remain in place for more than 5 days unless covered as directed by the Engineer. The Engineer will not measure unnecessary devices left in place. After 5 calendar days, the Engineer will deduct the contract unit price of the relevant pay item every day the unnecessary device remains in place and uncovered. If an unnecessary device remains in place and uncovered for more than 30 calendar days, the device will become the property of the Authority.

The installation and removal of the Temporary Roadway Lighting Assembly will be measured by the unit, complete in place, for each calendar day the device is required and is in place in an acceptable condition and position to meet all of the above requirements. Measurement for payment will be by the Luminaire Day (LMDY) beginning on the day that
the temporary roadway lighting assembly is in place and operational. A Luminaire Day is defined as any 24-hour day that the assembly is operational.

Temporary or permanent lighting assemblies with two luminaires will be measured as two luminaire days.

Temporary Roadway Lighting Assembly will be measured for payment with a 30-day minimum for each relocation.

The cost bid for Temporary Roadway Lighting Assembly may also be used for compensation for temporary lighting utilizing existing and/or permanent pole installations during the interim time between the time they are installed and operational and before the final circuit is accepted and the permanent service pole is operational.

Any existing lighting pole assembly that is being used for temporary lighting during construction will not be paid for until that assembly is connected to a circuit for which the Contractor is furnishing the electrical energy.

B. Lump Sum Item

The Authority will pay for Construction Traffic Control as a percentage equal to the work completed versus the amount bid for the Base Bid (i.e., Part “A”) minus the amount bid for traffic control. The Authority will pay for amounts of Construction Traffic Control remaining on the date of completion on the next estimate.

If additional days are necessary, the Engineer will calculate a daily rate by dividing the lump sum contract unit price for Construction Traffic Control by the number of calendar days in the contract time. The Engineer will calculate the additional compensation by multiplying the daily rate by the number of additional days.

If the Contractor fails to make corrections to devices as directed by the Engineer, penalties will be imposed as outlined in Subsection 880.04.

880.06 BASIS OF PAYMENT

The Authority will pay for each pay item at the contract unit price per the specified pay unit as follows:

<table>
<thead>
<tr>
<th>Pay Item:</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) ARROW DISPLAY (TYPE)</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(B) CONSTRUCTION SIGNS (SIZE)</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(C) CONSTRUCTION BARRICADES</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(D) VERTICAL PANELS</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(E) WARNING LIGHTS (TYPE)</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(F) DRUMS</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(G) TUBE CHANNELIZERS</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(H) CONES (SIZE)</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(I) FLAGGER</td>
<td>Sign Day</td>
</tr>
<tr>
<td>Pay Item</td>
<td>Pay Unit</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>(J) CONSTRUCTION TRAFFIC CONTROL</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>(K) SURVEILLANCE OF TRAFFIC CONTROL</td>
<td>Sign Day</td>
</tr>
<tr>
<td>(L) TEMPORARY ROADWAY LIGHTING ASSEMBLY</td>
<td>Luminaire Day</td>
</tr>
</tbody>
</table>

If the Contract includes a lump sum pay item for Construction Traffic Control, the Authority will consider the cost of installing and removing all construction traffic control to be included in the contract unit price for Construction Traffic Control.

The Authority will pay for Surveillance of Traffic Control, Traffic Surveillance, Police, and Arrow Display separate from the other construction traffic control pay items.

If the Engineer requires additional signing for safety, differing site conditions which require additional work and calendar days, or uncontrollable third party delays that require the extension of contract time, the Authority will pay for such by prorating the price bid for lump sum traffic control. The amount determined by multiplying the rate per day for construction traffic control by the number of additional days allowed by the Engineer will be the amount added by change order, and shall be full compensation for the additional work or third party delay.

Unless otherwise shown on the Plans or Special Provisions, construction traffic control devices remain the property of the Contractor upon project completion.

The Authority will consider the cost of incidental items for detours and other traffic control systems to be included in the contract unit price for other relevant pay items.

The Authority will consider the cost of providing two flaggers and lighting the flagger stations at night to be included in the contract unit price for Flagger.

The Authority will not pay for construction traffic control for time extensions due to unusually severe weather.

The Authority will not pay for devices on liquidated damage days.

If the Engineer suspends contract time for public safety in accordance with Subsection 108.07, “Administration and Extension of Contract Time,” the Authority will pay for construction traffic control during the period of suspension.

Payment will be considered full compensation for this item of work. Include all costs for the Temporary Roadway Lighting Assembly in the unit price bid for this item of work, including all materials, hardware, installation, relocations, removal upon completion of the project, any temporary service pole assembly, costs of electrical energy to the service pole necessary to operate the completed temporary lighting system, and all maintenance or repairs required to keep the system in operation during construction.

Do not include the cost for portable median barrier used to protect the temporary lighting assembly in this item of work.
OKLAHOMA TURNPIKE AUTHORITY
SPECIAL PROVISION
FOR
SECTION 882
CHANGEABLE MESSAGE SIGN
EOC-2465


*(Add the following:)*

882.01 DESCRIPTION

This work consists of providing, maintaining, and using a trailer-mounted changeable message sign or remote-controlled changeable message sign.

882.02 MATERIALS

Provide an internally-illuminated variable-message sign including the following characteristics:

- A magnetically operated matrix, LED, fiber optic, or lamp matrix message board,
- A solar and battery power supply,
- Hardware for connection to a 110 V power source,
- An on-board computer, and
- A computer-operated interface.

Mount on a towable, heavy duty trailer.

Provide a sign capable of three lines of text or symbols, each with seven rows and 40 columns of LED display elements. Provide solid state LEDs and LED energize/de-energize circuitry, directly embedded in the display element panel. Ensure each line consists of eight separate, interchangeable display element panels with seven rows and five columns of display elements. Provide display element panels with an evenly installed horizontal matrix, with 3 in between individual characters. Ensure each display element panel measures 18 in [457 mm] high by 13 in [330 mm] wide, with no separate driver boards required to drive the LEDs. Provide a separate wiring harness to power each LED pixel on the display element panels.

Provide sign display elements consisting of wide-angle LEDs that allow 30° legibility of the sign message. Ensure LEDs rated for at least a 100,000 hr life. Ensure the display elements operate at temperatures from −20 °F to 140 °F [−29 °C to 60 °C].

Ensure clear sign legibility from 1,000 ft [305 m].

Provide an onboard computer to control the sign. Ensure the sign automatically changes to a pre-selected default message upon failure, and it remains on display until the problem is corrected.
Equip the remote-controlled changeable message sign unit with a cellular telephone and a security system that prevents unauthorized sign access, but allows access through a password or code unique to that sign. If the password or code is not entered within 60 s of initial telephone contact, terminate the call. Control the remote-controlled changeable message sign with a touch tone modem decoder.

Provide a sign capable of storing up to 199 preprogrammed messages, and displaying any of the messages with a call through the trailer-mounted terminal for the changeable message signs and the remote-controlled changeable message signs. Ensure the sign retains the messages during power failure. Ensure sign operation if the sign keyboard controller is disconnected.

Provide a solar recharged battery pack as the primary power supply.

Provide a solar power supply consisting of solar cell modules installed in a rigid mount at the top of the sign case, and wired to the battery pack through a 30 A solar regulator. Ensure the solar regulator capable of 30 consecutive 24 hr days of operation, starting with a fully charged 12 V battery pack without sun under normal weather conditions. Include a temperature-compensated, voltage-regulated 110 V (AC) battery trickle charger, accessible from a standard plug-in convenience receptacle mounted in the side of the pedestal. Ensure a 110 V (AC) battery trickle charger capable of recharging the battery pack within 24 hr to 48 hr. Ensure the temperature-compensated voltage-regulated trickle charger automatically charges the batteries when 110 V (AC) is applied to the convenience receptacle. Do not require the operator to configure the charging system after plugging in the 110 V (AC) power source.

Provide four 12 V D-size batteries, deep cycle rated for solar power systems.

Ensure the lamp matrix, LED, or fiber optic sign equipped with a top-mounted photocell for automatic sign-dimming during night use.

Provide a trailer rated for 3,500 lb [1,588 kg] including an axle and springs rated for 3,500 lb [1,588 kg]. Ensure each trailer includes hydraulic surge brakes rated for 6,000 lb [2,722 kg], with a 2 in [50 mm] ball hitch.

Provide a trailer consisting of a frame and tongue constructed of square tube. Ensure the frame is at least 3 in by 3 in [75 mm by 75 mm] and \( \frac{3}{16} \) in [4.8 mm] thick; and the tongue is at least 3 in by 3 in [75 mm by 75 mm] and \( \frac{1}{8} \) in [6.4 mm] thick. Weld the tongue and trailer in accordance with AWS standards. Use ASTM 500 grade B alloy. Ensure the trailer is 196 in [4,978 mm] long by 79.5 in [2.019 mm] wide. Provide 15 in [375 mm], five lug wheels with holes for inserting a heavy chain to prevent vandalism. Provide size P205-75-15 rating B tires.

Provide the trailer with four leveling jacks, one at each corner, making the trailer and sign assembly capable of withstanding 104 mph [167 km/h] wind gusts.

**882.03 EQUIPMENT — VACANT**

**882.04 CONSTRUCTION METHODS.**

Provide, place, operate, maintain, and relocate the sign as shown on the Plans.
882.05 METHOD OF MEASUREMENT — VACANT

882.06 BASIS OF PAYMENT

The Authority will pay for each pay item at the contract unit price per the specified pay unit as follows:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) CHANGEABLE MESSAGE SIGN</td>
<td>Each or Sign Day</td>
</tr>
<tr>
<td>(B) REMOTE CONTROLLED CHANGEABLE MESSAGE SIGN</td>
<td>Each or Sign Day</td>
</tr>
</tbody>
</table>

The Authority will consider the cost of the cellular telephone and telephone charges required for the remote-controlled sign to be included in the contract unit price for Remote-Controlled Changeable Message Sign. The cellular phone will become the property of the Authority.

If the Contract includes an each pay item for Changeable Message Sign or Remote Controlled Changeable Message Sign, the portable changeable message signs will become the property of the Authority upon completion of the Project.

If the Contract includes a sign day pay item for Changeable Message Sign or Remote Controlled Changeable Message Sign, the portable changeable message signs will become the property of the Contractor upon completion of the Project.

The Authority will consider the cost of providing, placing at a location approved by the Engineer, maintaining, and operating one changeable message sign for 1 day to be included in the contract unit price for the relevant pay item.