

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**CLEARING AND GRUBBING**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains in general terms the description and procedures in Section 301- Clearing and Grubbing.		
Maintains the necessary records/documentation related to clearing and grubbing.		
Explains the three (3) different methods of measurement and payment.		
Describes the procedures for the preservation of historical grave sites as referenced in 107.16(d).		
Explains the requirements for clearing and grubbing as outlined in the CQIP questions, i.e., area limits, depth, perishable materials & objects, and disposal of trees & vegetation.		

*CITP JOB BOOK - 300 SERIES*  
**ROADWAY CONSTRUCTION**

**CLEARING AND GRUBBING**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**CLEARING AND GRUBBING**

*CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
301.01	Is the clearing and grubbing confined to the area within the construction limits and to other objects as designated on the plans and in the contract?
301.02(1)	Did the Contractor install erosion and siltation control devices prior to beginning clearing or grubbing operations?
301.02(2)	Has the Contractor confined the grubbing of root mat and stumps to the area over which excavation is to be actively prosecuted within 15 days following the grubbing operation?
301.02(3)	Have all items that will be less than 5 feet below the top of earthwork within the area directly below the pavement and shoulders, been removed?
301.02(4)	Are stumps, other perishable materials, and non-perishable objects that are left in place in accordance with this section?
301.02(5)	Have trees and vegetation been disposed of in accordance with this Section?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**DRAINAGE STRUCTURES**

**(PIPE & BOX CULVERTS)**

(2 pages)

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains in general terms the specifications related to Drainage Structures – Section 302.		
Describes <b>seven (7) of the eleven (11)</b> different types of structures covered by the term “drainage structures.”		
Maintains necessary records associated with at least one drainage structure.		
Explains the quality assurance requirements for pipe culverts (Sections 232 and 302.)		
Explains the proper methods of measurement and payment for pipe and box culverts.		
Explains the definition of “minor structure excavation.”		
Determines the dimensions of minor structure excavation at a drainage structure.		
Verifies compliance with the excavation and bedding requirements during the placement of a drainage structure.		
<b>Job elements continued on next page.</b>		

**CITP JOB BOOK - 300 SERIES**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Verifies that a drainage structure is being properly placed in terms of alignment and elevation.		
Interprets correctly the box culvert standards for one such structure.		
Checks the line and grade of a box culvert.		
Verifies that the contractor correctly forms and places the concrete and reinforcing steel.		
Performs the necessary testing procedures for concrete.		
Ensures that the contractor maintains correct drainage at the box culvert during construction.		
Ensures that stream diversions are installed in accordance with an approved in-stream plan, when required.		
Checks the following for compliance at either a pipe culvert or a box culvert: <ul style="list-style-type: none"> <li>• Foundation</li> <li>• Backfilling procedures &amp; compaction</li> <li>• Structure location in relation to stakeout</li> <li>• Cover above the structure</li> <li>• Skew</li> </ul>		

**ROADWAY CONSTRUCTION**

DRAINAGE STRUCTURES

(PIPE & BOX CULVERTS)

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **DRAINAGE STRUCTURES**

#### **PIPE & BOX CULVERTS**

#### *CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
302.02	Is the pipe the required gage and strength and do the other materials meet the requirements of this section?
302.03(2b)1	Has the pipe bedding material been lightly and uniformly compacted?
302.03(a)	Have all pipe culverts been checked to determine if damaged materials have been repaired or replaced?
302.03(a2a)2	Have the pipe culvert foundations been explored by the contractor below the bottom of the excavation?
302.03(a2a)3	Is the foundation firm, but not unyielding for its full length and width and excavated according to the standard drawings?
302.03(a2b)2	Has the bedding material been placed and shaped in accordance to this section?
302.03(a2c)2	Has the pipe been placed in accordance with this Section?
302.03(a2d)	Are the joints of the pipe tight and properly sealed?
302.03(a2g)2	Is the backfill placed in uniform layers at the specified thickness?
302.03(a2g)3	Is the backfill placed simultaneously and compacted on both sides of the pipe as specified?
302.03(a2g)4	Has all rock over 2 inches in it greatest dimension been removed from within 12 inches of the pipe?
302.03(a2g)5	Were the requirements of the Standard Drawings (PC-1) for cover and length of approach fills met before construction equipment was allowed to cross the pipe?
302.03(b1a)	Does the grade of the throat section of the inlets meet the appropriate grade of the gutter?
302.03(b1b)	Is the pipe opening in the precast units not more than 8 inches larger than the outside diameter of the pipe?
302.03(b1c)	Has the void between the pipe and precast structures been filled as specified?

## *CITP JOB BOOK - 300 SERIES*

- 302.03(b1d) Have precast units, which are located adjacent to the subbase or base course, been provided with 3 inches in diameter weep holes and hardware cloth?
- 302.03(b1e) Are precast units, which are located adjacent to cast-in-place items, been connected by means of number 4 smooth steel dowels spaced on approximately 12-inch center?
- 302.03(b1f)1 Have the chamber sections been installed in the plumb position?
- 302.03(b1f)2 Do the throat and top sections have positive restraints and interlocks to prevent displacement?
- 302.03(b1f)3 Has the throat section been installed to conformed with the normal slope of the finished grade?
- 302.03(b2b) Has the buildup section been constructed as specified?
- 302.03(b2b) Have exposed reinforcing bars, inserts, and plates intended for bonding with future extensions of precast arches been protected from corrosion?
- 302.03(b2d) Have the joints between precast arch units been sealed using preformed plastic or mastic gaskets or grout?
- 302.03(b3c)1 Has preformed plastic or mastic gaskets been used to seal the joints between precast box culvert units?
- 302.03(b3c)2 Has the required buffer zone been provided between lines of box culvert units and has it been backfilled as specified?
- 302.03(b3c)3 Have weep holes been provided in the precast box culvert as required?
- 302.03(b3d)1 Has sufficient anchorage been provided at the terminus of the precast box culvert units?
- 302.03(b3d)2 Has the skew for precast box culvert units been formed by saw cutting, or other methods approved by the Engineer, and there is no variation from the exact skew greater than 1-1/2 inches at any one point?
- 302.03(b3f) Has a minimum of 6 inches thickness of bedding been placed for the precast box culvert foundation?
- 302.03(c)1 Has masonry construction been initiated only when the air temperature is above 40 degrees F in the shade for drop inlets, manholes, spring boxes, intake boxes and end walls?
- 302.03(c)2 Has the adjustment of existing drainage structures been performed in accordance with this section?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**EARTHWORK (BORROW MATERIALS: BORROW  
EXCAVATION AND SELECT BORROW)**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Describes the process of obtaining the necessary Approvals in order for the contractor to obtain the rights to use a borrow site/pit.		
Properly applies the specifications related to borrow excavation and select borrow (Section 303).		
Completes the necessary soils testing of the borrow excavation and select borrow.		
Completes the measurement of the volume of a borrow area by the proper methods.		
Enters the necessary records associated with borrow materials.		

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

EARTHWORK (BORROW MATERIALS: BORROW  
EXCAVATION AND SELECT BORROW)

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **EARTHWORK (BORROW MATERIALS: BORROW EXCAVATION AND SELECT BORROW)**

#### *CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
303	On projects being constructed under the No Plan and Minimum Plan concept, is the work in accordance with the specifications for No Plan and Minimum Plan projects.
303.04(a)02	Have underground tanks, existing foundations, and slabs located within the construction limits been removed and disposed of in an approved manner?
303.04(a)03	Have foundations and slabs located 5 feet or more below subgrade been broken into particles not more than 18 inches in any dimension and reoriented to break the shear plan and allow for drainage?
303.04(a)04	Have cisterns, septic tanks, and other structures been filled with broken foundation masonry or rock placed in uniform layers and thoroughly compacted?
303.04(a)5	Have wells been closed in accordance with the section on Demolition of Buildings and Clearing Parcels?
303.04(a)6	Did the Contractor schedule the excavation work so that blasting operations in the proximity of proposed concrete structures would be completed prior to initial placement of concrete?
303.04(a)7	Is the roadway being graded in such a manner that will provide adequate drainage?
303.04(a)8	In areas where rock or boulders were encountered during excavation, were they graded in accordance with specified methods for standard RU-1 undercut?
303.04(a)9	Did the Contractor immediately stop excavation and notify the Engineer when solid rock was not encountered at the depth indicated on the plans?
303.04(a)10	Has excavation and embankment construction been confined to the minimum area necessary to accommodate the Contractor's equipment and work force engaged in the earth moving work?
303.04(c)	Is undercut excavation being removed, measured and paid for in accordance with this section and material to be disposed of a removed in accordance with Section 106.04 of the general provisions on disposal areas?

## *CITP JOB BOOK - 300 SERIES*

- 303.04(e)2 Has the excavation for structures been carried to foundation materials satisfactory to the Engineer?
- 303.04(e)3 During construction, if unsuitable material shown on the plan is found to be suitable, is it used in embankments in lieu of borrow material?
- 303.04(e)4 Has the unsuitable material been disposed of in accordance with Section 106.04 of the general provisions on disposal areas?
- 303.04(g)1 Has the opening to be backfilled been dewatered prior to placing any backfill material?
- 303.04(g)2 Has the backfill material been placed in horizontal layers not more than 6 inches in thickness, loose measurement, and compacted?
- 303.04(g)3 Has the backfill been placed in a manner to deter impoundment of water and facilitate existing drainage?
- 303.04(g)4 Has the required compressive strength been obtained and 4 feet of backfill cover been placed over box culverts prior to construction equipment traffic crossing them?
- 303.04(g)5 When embankment is placed on both sides of the structure, is it placed simultaneously on each side at approximately the same elevations or as specified?
- 303.04(h)2 If rock excavation is available on the project, has an 8 to 15 inch layer of such materials been placed over the lower region of embankments as specified?
- 303.04(h)3 Wherever sufficient right of way exists, were surplus materials used to widen embankments and flatten fill slopes as directed by the Engineer?
- 303.04(h)4 Has the placement of geotextile drainage fabric under rock fills been performed in accordance with the Section 414, Riprap?
- 303.04(h)5 Has the surface area directly beneath the pavement and shoulders, on which embankments of <5' depth are to be constructed, been denuded of vegetation, scarified and compacted to a depth of 6" to the same degree as the material to be placed thereon?
- 303.04(h)6 Have embankments placed in swampy areas been constructed by end dumping successive loads in a uniformly distributed layer of a thickness capable of supporting the hauling equipment while subsequent layers are placed?
- 303.04(h)7 Is the nose, or leading edge, of the embankment being maintained in a wedge shape to facilitate mud displacement in a manner that prevents its entrapment in the fill?

## *CITP JOB BOOK - 300 SERIES*

- 303.04(h)8 After the original course of fill is placed in swampy areas, is the remainder of the embankment constructed in layers and compacted in accordance with the specifications?
- 303.04(h)9 Has the surface of the existing road been scarified to such degree that permits an ample bond between old and new materials?
- 303.04(h)10 Have hydraulic cement concrete and asphalt concrete pavements within the roadway prism been demolished in accordance with Section 508, Demolition of Pavement and Obscuring Roadway?
- 303.04(h)11 Have cement-stabilized courses underlying the demolished pavements been removed when they are 5 feet or less below subgrade elevation? (Ref.: Section 508.02(a)3 of Demolition of Pavement and Obscuring Roadway.)
- 303.04(h)12 Have cement-stabilized courses that are located more than 3 feet below subgrade elevation been removed or broken into particles not more than 18 inches in any dimension, sufficiently displaced to allow for adequate drainage, and left in place?
- 303.04(h)13 Have existing slopes been benched to receive fill materials as specified?
- 303.04(h)14 Are embankments being constructed in uniform layers of specified thickness over the entire fill area?
- 303.04(h)15 Is the embankment being rolled to the outside of the fill and compacted at  $\pm 20$  percent of optimum moisture content to a density of at least 95 percent of theoretical maximum density?
- 303.04(h)16 Has material with a moisture content more than 30 percent above optimum moisture been placed on a previously placed layer of fill?
- 303.04(h)18 As the compaction of each layer progresses, has continuous leveling and manipulation been performed to ensure uniform density?
- 303.04(h)19 Prior to the placement of subsequent layers, has construction equipment been routed uniformly over the entire surface of each layer or the layer scarified to its full depth in the area where the equipment was routed?
- 303.04(h)20 Are rock fills being constructed as specified?
- 303.04(h)2a Has unsuitable material used to widen embankments and flatten fill slopes been placed in uniform layers not more than 18 inches in thickness and compacted to the extent necessary to produce stable and reasonably even slopes?
- 303.04(i)1 Has the Contractor expedited construction of embankment fills to provide the maximum time possible for settlement as specified?

## *CITP JOB BOOK - 300 SERIES*

- 303.04(i)2 Is al settlement plate and surcharge embankment construction performed in accordance with this section?
- 303.04(j) Are hydraulic embankments constructed in accordance with this section?
- 303.04(k)1 Is the surplus material being disposed of in accordance with Section 106.04, Disposal Areas?
- 303.05(b) Has the finished grade of the top of earthwork and all slopes been constructed within the specified tolerances of this section?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**EARTHWORK (EXCAVATION AND EMBANKMENTS)**

(2 PAGES)

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains in general terms the overall procedures (Section 303) related to excavation and embankment.		
Maintains the proper records.		
Describes the proper methods and payment methods related to excavation and embankments (Section 303)		
Performs the proper testing requirements.		
Checks cut and fill slope ratios for compliance with the plans and OSHA regulations.		
Determines the quantity of excavation of a roadway section by cross sectioning the area.		
Explains restrictions on the placement of rock fill in embankments.		
Explains the procedures for the removal of such items as concrete pavement, curb & gutter, etc.		
Determines whether or not the proper compaction equipment is being used.		
Explains the prescribed procedures associated with the hauling, spreading, and benching of a fill.		
<b>Note: Job elements continued on next page.</b>		

**CITP JOB BOOK - 300 SERIES**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Verifies that a roadway fill section is being properly placed.		
Explains in general terms the prescribed tolerances on earthwork.		
Verifies that the earthwork in a roadway section is being placed within the prescribed tolerances.		
Explains the need to properly drain earthwork.		
Verifies that an embankment is being placed in a manner to allow proper drainage.		
Explains in general terms the need for the additional specifications related to earthwork: <ul style="list-style-type: none"> <li>• Section 106 – Disposal Areas</li> <li>• Section 414 – Riprap</li> <li>• Section 508 – Demolition</li> <li>• Section 516 – Demolition of Buildings And Clearing Parcels</li> </ul>		

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**EARTHWORK (EXCAVATION AND EMBANKMENTS)**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **EARTHWORK (EXCAVATION AND EMBANKMENTS)**

#### *CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
303	On projects being constructed under the No Plan and Minimum Plan concept, is the work in accordance with the specifications for No Plan and Minimum Plan projects?
303.04(a)2	Have underground tanks, existing foundations, and slabs located within the construction limits been removed and disposed of in an approved manner?
303.04(a)3	Have foundations and slabs located 5 feet or more below subgrade been broken into particles not more than 18 inches in any dimension and reoriented to break the shear plan and allow for drainage?
303.04(a)4	Have cisterns, septic tanks, and other structures been filled with broken foundation masonry or rock placed in uniform layers and thoroughly compacted?
303.04(a)5	Have wells been closed in accordance with the section on Demolition of Buildings and Clearing Parcels?
303.04(a)6	Did the Contractor schedule the excavation work so that blasting operations in the proximity of proposed concrete structures would be completed prior to initial placement of concrete?
303.04(a)7	Is the roadway being graded in such a manner that will provide adequate drainage?
303.04(a)8	In areas where rock or boulders were encountered during excavation, were they graded in accordance with specified methods for standard RU-1 undercut?
303.04(a)9	Did the Contractor immediately stop excavation and notify the Engineer when solid rock was not encountered at the depth indicated on the plans?
303.04(a)10	Has excavation and embankment construction been confined to the minimum area necessary to accommodate the Contractor's equipment and work force engaged in the earth moving work?
303.04(c)	Is undercut excavation being removed, measured and paid for in accordance with this section and material to be disposed of and removed in accordance with Section 106.04 of the general provisions on disposal areas?

## *CITP JOB BOOK - 300 SERIES*

- 303.04(e)2 Has the excavation for structures been carried to foundation materials satisfactory to the Engineer?
- 303.04(e)3 During construction, if unsuitable material shown on the plan is found to be suitable, is it used in embankments in lieu of borrow material?
- 303.04(e)4 Has the suitable material been disposed of in accordance with Section 106.04 of the general provisions on disposal areas?
- 303.904(g)1 Has the opening to be backfilled been dewatered prior to placing any backfill material?
- 303.04(g)2 Has the backfill material been placed in horizontal layers not more than 6 inches in thickness, loose measurement, and compacted?
- 303.04(g)3 Has the backfill been placed in a manner to deter impoundment of water and facilitate existing drainage?
- 303.04(g)4 Has the required compressive strength been obtained and 4 feet of backfill cover been placed over box culverts prior to construction equipment traffic crossing them?
- 303.04(h)2 If rock excavation is available on the project, has an 8 to 15 inch layer of such materials been placed over the lower region of embankments as specified?
- 303.04(h)3 Wherever sufficient right of way exists, were surplus materials used to widen embankments and flatten fill slopes as directed by the Engineer?
- 303.04(h)4 Has the placement of geotextile drainage fabric under rock fills been performed in accordance with the Section 414, Riprap?
- 303.04(h)5 Has the surface area directly beneath the pavement and shoulders, on which embankments of <5' depth are to be constructed, been denuded of vegetation, scarified and compacted to a depth of 6" to the same degree as the material to be placed thereon?
- 303.04(h)6 Have embankments placed in swampy area been constructed by end dumping successive loads in a uniformly distributed layer of a thickness capable of supporting the hauling equipment while subsequent layers are placed?
- 303.04(h)7 Is the nose, or leading edge, of the embankment being maintained in a wedge shape to facilitate mud displacement in a manner that prevents its entrapment in the fill?
- 303.04(h)8 After the original course of fill is placed in swampy areas, is the remainder of the embankment constructed in layers and compacted in accordance with the specifications?

## *CITP JOB BOOK - 300 SERIES*

- 303.04(h)9 Has the surface of the existing road been scarified to such degree that permits an ample bond between old and new materials?
- 303.04(h)10 Have hydraulic cement concrete and asphalt concrete pavements within the roadway prism been demolished in accordance with Section 508, Demolition of Pavement and Obscuring Roadway?
- 303.04(h)11 Have cement-stabilized courses underlying the demolished pavements been removed when they are 1 meter or less below subgrade elevation? (Ref.: Section 508.02(a)3 of Demolition of Pavement and Obscuring Roadway)
- 303.04(h)12 Have cement-stabilized courses that are located more than 5 feet below subgrade elevation been removed or broken into particles not more than 18 inches in any dimension, sufficiently displaced to allow for adequate drainage, and left in place?
- 303.04(h)13 Have existing slopes been benched to receive fill materials as specified?
- 303.04(h)14 Are embankments being constructed in uniform layers of specified thickness over the entire fill area?
- 303.04(h)15 Is the embankment being rolled to the outside of the fill and compacted at  $\pm$  20 percent of optimum moisture content to a density of at least 95 percent of theoretical maximum density?
- 303.04(h)16 Has material with a moisture content more than 30 percent above optimum moisture been placed on a previously placed layer of fill?
- 303.04(h)17 As the compaction of each layer progresses, has continuous leveling and manipulation been performed to ensure uniform density?
- 303.04(h)18 Prior to the placement of subsequent layers, has construction equipment been routed uniformly over the entire surface of each layer or the layer scarified to its full depth in the area where the equipment was routed?
- 303.04(h)19 Are rock fills being constructed as specified?
- 303.04(h)2a Has unsuitable material used to widen embankments and flatten fill slopes been placed in uniform layers not more than 18 inches in thickness and compacted to the extent necessary to produce stable and reasonably even slopes?
- 303.04(i)1 Has the Contractor expedited construction of embankment fills to provide the maximum time possible for settlement as specified?
- 303.04(i)2 Is all settlement plate and surcharge embankment construction performed in accordance with this section?

## *CITP JOB BOOK - 300 SERIES*

- 303.04(j) Are hydraulic embankments constructed in accordance with this section?
- 303.04(k)1 Is the surplus material being disposed of in accordance with Section 106.04, Disposal Areas?
- 303.05(b) Has the finished grade of the top of earthwork and all slopes been constructed within the specified tolerances of this section?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

EARTHWORK (UNDERCUT EXCAVATION AND BACKFILL)

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains in general terms the Specifications related to undercut excavation including the proper methods of measurement and payment for undercut (Section 303.)		
Recognizes potential unsuitable materials on the project.		
Contacts the correct person(s) for verification that the material is unsuitable.		
Explains who on the project can authorize undercut.		
Verifies that an undercut section is being completed properly.		
Verifies that an undercut section is properly protected prior to backfilling.		
Verifies that an undercut section is properly backfilled.		
Maintains appropriate records related to undercut excavation.		
Explains in general terms the Specifications related to backfill including the proper methods for measurement and payment (Section 303.)		
Describes the proper backfilling technique.		
Completes the proper testing requirements for the backfill.		
Explains how unsuitable material is handled when it is found to be suitable during construction.		
Verifies that backfill is properly layered and scarified.		

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**EARTHWORK (UNDERCUT EXCAVATION AND  
BACKFILL)**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**SUBGRADE AND SHOULDERS**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Checks grade requirements on a 1,000-foot section of roadway (to include both tangent & radial sections) for compliance with plan profiles.		
Recognizes characteristics of unsuitable subgrade.		
Explains subgrade and shoulder requirements in terms of: <ul style="list-style-type: none"><li>• Compaction</li><li>• Drainage of the subgrade</li></ul>		

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**SUBGRADE AND SHOULDERS**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **SUBGRADE AND SHOULDERS**

#### *CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
305.03(A1)1	Has the subgrade been scarified to a depth of 6” for a distance of 2 feet beyond the proposed edge of the pavement on each side?
305.03(a1)2	Has all unsuitable materials been removed and replaced with suitable material that will permit compaction?
305.03(a1)3	Has the subgrade been compacted within plus or minus 20 percent optimum moisture and to 100% density with consideration of +4 material?
305.03(b)	When solid rock occurs in cuts or the material is not suitable for subgrade or finishing purposes, is the roadbed excavated below the grade shown on the plans and backfilled in accordance with the Standard Drawings for RU-1?
305.03(c)	Did the Contractor provide effective drainage for the subgrade and maintain it in a satisfactory condition until the next course was placed?
305.03(e)	Was the aggregate shoulder material placed in accordance with the applicable specifications governing the type material or construction being used?
305.03(e)	Was the aggregate material compacted within plus or minus 2 percentage points of optimum moisture to the required density?
305.03(e)	If the aggregate shoulder material became over consolidated prior to final finishing, was it scarified for the approximate depth, reshaped, and recompactd to conform to the typical cross section?
305.03(e)	Were the shoulders constructed simultaneously or in advance with non-rigid types of base or surface courses to prevent spreading of the base or surface materials.
305.03(e)	When the base or surface courses are being constructed under traffic and exceed one inch in depth, is the adjacent shoulder material placed within 72 hours?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**SOILS COMPACTION TESTS**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains the necessity of soil compaction tests and the applicable specifications.		
Explains how an area is selected for testing.		
Explains the frequency requirements for tests.		
Explains the size requirements of the testing holes.		
Explains calibration requirements of testing sand.		
Completes required computations for soil compaction tests.		
Selects additional information for tests i.e., elevation, station, etc., as needed.		
Completes proctor mold and associated computations.		
Explains actions to be taken upon test failures.		
Plot/records profile information.		
Determines moisture content and requirements.		
Properly cares for testing equipment.		

**ROADWAY CONSTRUCTION**

**SOILS COMPACTION TESTS**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**SOILS COMPACTION TESTS**

*CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
305.03(a1)2	Has all unsuitable materials been removed and replaced with suitable material that will permit compaction?
305.03(a1)3	Has the subgrade been compacted within plus or minus 20 percent optimum moisture and to 100% density with consideration of +4 material?
306.03(f)	Has the material been compacted and finished in accordance with this section?
308.03(4)	If the subbase when compacted and shaped shows a deficiency in thickness or if depressions occur in the surface, did the Contractor scarify the subbase before adding additional material?
401.03(c)3	Were approach embankments placed and compacted to top of footing elevation prior to excavation for and placement of footings installed above original ground?
401.03(c)4	If the footing is subject to movement because of pressure from overlying or adjacent fill, was the fill compacted in place before the footing was placed?
401.03(ii)2	Are the excavated spaces backfilled in uniform lifts and compacted as required by this section?

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**ROADWAY CONSTRUCTION**

**NUCLEAR COMPACTION**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Completes nuclear compaction certification requirements.		
Uses the manual of operations for nuclear compaction.		
Wears the nuclear badge when working with nuclear compaction device.		
Calibrates the nuclear device.		
Uses the proper forms and charts.		
Establishes optimum roller pattern for one of the following: soils, aggregate, or asphalt.		
Properly cares for nuclear compaction device.		

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**ROADWAY CONSTRUCTION**

**NUCLEAR COMPACTION**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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**ROADWAY CONSTRUCTION**

**HYDRAULIC CEMENT (SOIL CEMENT) or**  
**LIME STABILIZATION**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains in general terms the related specifications.		
Explains the weather limitations.		
Maintains necessary records.		
Determines proper methods of measurement and payment.		
Performs required testing procedures if applicable.		
Explains why soil cement or lime is used.		
Verifies depth during mixing the hydraulic cement or lime stabilization.		
Verifies the proper application of the cement or lime.		
Computes square yardage of manipulation.		
Verifies that curing operations comply with specifications.		
Verifies cement or lime is within the required tolerances.		

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**ROADWAY CONSTRUCTION**

HYDRAULIC CEMENT (SOIL CEMENT) or  
LIME STABILIZATION

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **HYDRAULIC CEMENT (SOIL CEMENT) or LIME STABILIZATION**

#### *CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
307.02(a)	Has the cement been transported, stored and otherwise protected in accordance with Section 217, Hydraulic Cement Concrete?
307.04(1)	Was cement stabilization performed in accordance with specified weather limitations?
307.04(2)	If there is a possibility of freezing temperatures during the first 24 hours of curing, is the stabilized material protected from freezing for 7 days or covered within 4 hours after the cement stabilization is finished?
307.05(a)1	Has the roadbed surface been graded to the approximate line, grade and cross section?
307.05(a)2	Is the surface sufficiently firm to support construction equipment and in such condition that the required compaction can be obtained?
307.05(b)1	Has the material in the road bed to be stabilized been scarified and pulverized with any objectionable objects and material retained on the 3 inch sieve removed prior to cement application?
307.05(b)1)1	Has the cement been applied uniformly and thoroughly blended by equipment capable of handling and spreading the cement as required?
307.05(b)1)2	Has the necessary water to obtain optimum moisture been added within one hour?
307.05(b)2)1	Have the mixed materials been transported and spread as required?
307.05(b)2)2	Has compaction of the cement-treated moisture been started within 60 minutes of the start of mixing at the plant?
307.05(c)1	Has the subgrade stabilization been compacted to the density required?

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<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
307.05(c)2	Has the processed section been completed and compacted to the specified density within 4 hours from the time water was added?
307.05(c)3	Have the compacting and finishing operations produced a smooth, dense surface as specified?
307.05(c)4	Is the subbase or base stabilization compacted in accordance with the density requirements in specifications for aggregate base course?
307.05(d)	Have construction joints been installed as required?
307.05(e)1	Is the density of the completed work in compliance with the tolerances as specified?
307.05(e)2	Has the contractor corrected areas that are deficient in thickness by more than 25 mm?
307.05(f)	Has the stabilized course been protected and maintained in a satisfactory condition until accepted?

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**ROADWAY CONSTRUCTION**

HYDRAULIC CEMENT STABILIZATION  
(CEMENT-STABILIZED SUBBASE/AGGREGATE)

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains the associated specifications in general terms.		
Maintains necessary records.		
Determines proper methods of measurement and payment.		
Performs required testing procedures.		
Describes the weather limitations.		
Verifies the required time limit on placement and compaction.		
Verifies that proper equipment and placement methods are used.		
Explains the tolerances associated with cement stabilized subbase.		
Verifies that curing operations comply with specifications.		
Checks for compliance with requirements of cement stabilized subbase in terms of: 1. Compaction of subgrade stabilization 2. Finishing operations 3. Protection before acceptance		

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**ROADWAY CONSTRUCTION**

HYDRAULIC CEMENT STABILIZATION  
(CEMENT-STABILIZED SUBBASE/AGGREGATE)

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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## **ROADWAY CONSTRUCTION**

### **HYDRAULIC CEMENT STABILIZATION** **(CEMENT-STABILIZED SUBBASE/AGGREGATE)**

#### *CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
307.02(a)	Has the cement been transported, stored and otherwise protected in accordance with Section 217, Hydraulic Cement Concrete?
307.04(1)	Was cement stabilization performed in accordance with specified weather limitations?
307.04(2)	If there is a possibility of freezing temperatures during the first 24 hours of curing, is the stabilized material protected from freezing for 7 days or covered within 4 hours after the cement stabilization is finished?
307.05(a)1	Has the roadbed surface been graded to the approximate line, grade and cross section?
307.05(a)2	Is the surface sufficiently firm to support construction equipment and in such condition that the required compaction can be obtained?
307.05(b)1	Has the material in the roadbed to be stabilized been scarified and pulverized with any objectionable objects and material retained on the 3 inch sieve removed prior to cement application?
307.05(b)2	Has the aggregate sub base, aggregate base, select material and select borrow been mixed in accordance with the requirements of this section?
307.05(b1)1	Has the cement been applied uniformly and thoroughly blended by equipment capable of handling and spreading the cement as required?
307.05(b1)2	Has the necessary water to obtain optimum moisture been added within one hour?
307.05(b2)1	Have the mixed materials been transported and spread as required?
307.05(b2)2	Has compaction of the cement-treated mixture been started within 60 minutes of the start of mixing at the plant?
307.05(c)1	Has the subgrade stabilization been compacted to the density required?

## *CITP JOB BOOK - 300 SERIES*

- 307.05(c)2 Has the processed section been completed and compacted to the specified density within 4 hours from the time water was added?
- 307.05(c)4 Is the subbase or base stabilization compacted in accordance with the density requirements in specifications for aggregate base course?
- 307.05(d) Have construction joints been installed as required?
- 307.05(e)1 Is the density of the completed work in compliance with the tolerances as specified?
- 307.05(e)2 Has the contractor corrected areas that are deficient in thickness by more than 25 mm?
- 307.05(f) Has the stabilized course been protected and maintained in a satisfactory condition until accepted?

**ROADWAY CONSTRUCTION**

**SUBBASE COURSE (& AGGREGATE BASE COURSE)**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**SUBBASE COURSE (& AGGREGATE BASE COURSE)**

*CQIP CHECKLIST*

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
308.03(1)	Has the material been placed on the subgrade using an aggregate spreader as specified?
308.03(2)	Has the subbase course been compacted at specified moisture plus or minus 20 percent and to the minimum of 100% density with consideration of +4 material?
308.03(3)	If the surface of the subbase becomes uneven or distorted and sets up in that condition, was it scarified, reshaped, and recompacted?
308.03(4)	If the subbase when compacted and shaped shows a deficiency in thickness or if depressions occur in the surface, did the Contractor scarify the subbase before adding additional material?
308.04	Does the depth of the subbase course meet the tolerances of the plan depth as specified?

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## **ROADWAY CONSTRUCTION**

### **LIQUID BITUMINOUS MATERIAL**

**(Tack, Prime and Seal Coats, Asphalt Surface Treatment, and Penetration Surface Courses)**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explains the associated specifications in general terms.		
Maintains necessary records.		
Determines proper methods of measurement and payment.		
Completes necessary testing procedures.		
Differentiates the uses of the various grades of liquid bituminous material.		
Accurately determines the quantity of material used from the distributor truck.		
Completes the correct sampling procedures.		
Properly checks application rate.		
Verifies that the surface was properly prepared prior to application.		
Explains the various types of covering materials and their applications.		
Verifies that the material was properly covered.		
Verifies liquid bituminous material requirements in terms of: <ul style="list-style-type: none"><li>• Weather limitations</li><li>• Cover materials</li><li>• Protection of the prime coat</li><li>• Cutback asphalt</li><li>• Temperature requirements</li></ul>		

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**ROADWAY CONSTRUCTION**

LIQUID BITUMINOUS MATERIAL

(Tack, Prime and Seal Coats, Asphalt Surface Treatment, and Penetration Surface Courses)

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **LIQUID BITUMINOUS MATERIAL**

**(Tack, Prime and Seal Coats, Asphalt Surface Treatment, and Penetration Surface Courses)**

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
310.02	Does the type and grade of liquid asphalt comply with contract requirements?
310.03(1)	Does the liquid asphalt material application temperature conform to the requirements of table for Liquid Asphalt Application Temperature?
310.03(2)	During the application of asphalt, has care been taken to prevent spattering adjacent items?
310.03(4)	Has the existing surface been patched, cleaned, and rendered free from irregularities to the extent necessary to provide a reasonably smooth and uniform surface?
310.03(5)	Have the vertical edges of the existing pavements that are adjacent to new pavements been cleaned to permit adhesion of the asphalt?
310.03(6)	Has asphalt been applied at the specified rate per square yard?
310.03(7)	Has the tack coat been applied in accordance with the same weather limitations that apply to the course being placed?
311.02(b)	Do the cover materials conform to the requirements of the Specifications of aggregate materials?
311.03(1)	When asphalt is used as a cover for cement stabilization or as a primer for asphalt concrete, are the weather limitations specified for these particular operations met?
311.03(2)	Has the surface to be primed been shaped to the required grade and section; rendered free from ruts, corrugations, segregated material, or other irregularities; and uniformly compacted?
311.03(3)	Has excess asphalt been removed at the junction of spreads?
311.03(4)	Has the prime been protected from traffic until the asphalt has penetrated and will not pick up?

## *CITP JOB BOOK - 300 SERIES*

- 312.04(1) Has the area to receive the application of asphalt material been cleaned of dust, mud and foreign matter?
- 312.04(2) Is a strip of building paper at least 3 feet in width and having a length equal to that of the spray bar of the distributor plus 1 foot being used at the beginning of each spread?
- 312.04(3) Have skipped areas and deficiencies been corrected?
- 312.04(4) Is the length of spread of asphalt regulated by the quantity of cover material loaded into trucks?
- 312.04(5) Is the spread of the asphalt no more than 6 inches wider than the width of the cover material being applied?
- 312.04(6) Is the cover material applied in full-lane widths up to 12 feet immediately following asphalt application?
- 312.04(7) Does the rolling begin immediately after the cover material is applied and consist of at least three complete passes?
- 312.04(8) Is the wearing surface of the seal being maintained and excess material swept off the surface by means of a rotary broom as required or directed by the Engineer?
- 313.03(a)1 Is the prime coat and cover material being applied in accordance with sections on prime and seal coat?
- 313.03(a)2 Has the prime coat been permitted to cure prior to the next application of asphalt?
- 313.03(a)3 During the period between the application of the prime coat and seal coat, is the prime coat maintained and kept in repair as specified?
- 313.03(b)1 Is the seal coat being applied in accordance with the section on Seal Coat?
- 313.03(b)2 When cutback asphalt is used for the first seal coat, is the seal coat maintained and permitted to cure for at least 48 hours?
- 314.03 Is the Contractor complying with the weather limitations for application of various surface treatments?
- 314.04 Do the spreaders, distributors and rollers conform to the requirements for equipment in the specifications for surface treatments?

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- SP-BSC(I) Are the number of applications of liquid asphalt and cover material in accordance with Type B, C, or D Blotted Seal as shown on the plans?
- SP-BSC(II) Is the liquid asphalt, cover aggregate, and fine aggregate in conformance with the material requirements of Section II of the Special Provision?
- SP-BSC(III)1 Are the application rates for the asphalt and aggregate material in accordance with those shown on the plans or altered as directed by the Engineer?
- SP-BSC(III)2 During application, was the temperature of the liquid asphalt material maintained between 160 and 175 degrees F?
- SP-BSC(IV)1 Is each application of liquid asphalt material immediately followed by an application of aggregate?
- SP-BSC(IV)2 Is the aggregate immediately rolled by one pass of a self-propelled steel wheel roller which weighs between 6 and 8 tons if tandem type or between 8 and 10 tons if three wheel type?
- SP-BSC(IV)3 Is the blot coat applied with a self-propelled aggregate spreader of an approved design and immediately rolled one pass with a self-propelled roller?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**ASPHALT CONCRETE PAVEMENT**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Explain how you determine if the surface of existing pavement or base is irregular. If so, explain what should be done?		
Explain how you determine if the proper mix is being placed.		
Explain the requirement for placing tact along the surface and along the joints.		
Explain the method you use when straight edging the joint.		
Explain how you determine that the surface has been milled properly.		
Explain the process the contractor uses to secure the roller pattern and proper test strip.		
Explain how you determine the proper asphalt temperature range.		
Explain how you determine the proper lift thickness on asphalt.		
Explain how to properly roll the asphalt to include the mat and the joint.		

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**ASPHALT CONCRETE PAVEMENT**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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# *CITP JOB BOOK - 300 SERIES*

## **ROADWAY CONSTRUCTION**

### **ASPHALT CONCRETE PAVEMENT**

#### **CQIP CHECKLIST**

<b><u>SECTION</u></b>	<b><u>QUESTIONS</u></b>
315.03(A)1	Do the trucks hauling asphalt have tight, clean, smooth metal bodies?
315.03(a)2	Are the trucks hauling asphalt equipped with the proper cover to protect the mixture?
315.03(b)	Has the asphalt paver been approved prior to any paving operation and does it produce a finished surface as required?
315.03(c)	Do the rollers leave the surface in an acceptable condition?
315.03(d)	Has the Contractor sawed the required sample as specified?
315.04(1)	Were the weather and surface conditions during placement of the asphalt mixture as required?
315.04(2)	Are the minimum laydown temperatures as specified?
315.04(3)	Are intermediate and base courses exceeding the application rate given in Table II-2 placed as specified?
315.05(b)1	Has the surface of existing pavement or base that is irregular been corrected as required?
315.05(b)2	Have longitudinal and transverse cracks in hydraulic cement concrete been sealed prior to placement of asphalt?
315.05(b)3	Have all contact surfaces and cold joints of asphalt been painted as required prior to asphalt placement.
315.05(b1)1	Has a tack or prime coat of asphalt been applied as specified?
315.05(b1)2	Have asphalt cutbacks or emulsions been applied and allowed to form a tacky residue prior to the application of the paving mixture?
315.05(b1)3	Have tack or prime coats which have been damaged or contaminated been repaired prior to placing the paving mixture?

## *CITP JOB BOOK - 300 SERIES*

- 315.05(b2) Have irregularities in the existing surface that would result in a compacted thickness of over 3 inches been repaired as specified?
- 315.05(c)1 Has a continuous line been placed/maintained to control pavement width/alignment?
- 315.05(c)2 Has the longitudinal joint of each layer been offset approximately 6 six inches or as specified?
- 315.05(c)3 Has the certified Asphalt Concrete Paving Technician inspected and straight-edged each layer as required prior to compaction?
- 315.05(c)4 Are the specified rates and depth adhered to when placing asphalt concrete base, intermediate and surface course?
- 315.05(d)1 Does rolling begin immediately after placement and continue until the mixture is thoroughly and uniformly compacted?
- 315.05(d)2 Are there sufficient rollers to obtain the required compaction of the mixture?
- 315.05(d)3 Has the rolling of the mixture been accomplished as required by the specifications?
- 315.05(d)4 In areas not accessible to rollers, has the material been compacted as required?
- 315.05(d)5 Are the edges of the pavement surface true curves or tangents as required?
- 315.05(d)6 Are the surfaces of the compacted courses protected until the material has cooled sufficiently to support traffic without marring?
- 315.05(e)1 Does the density of the compacted course meet the requirements as specified?
- 315.05(e)2 Did the Contractor furnish and operate a nuclear density gage, which had been calibrated within the previous 12 months by an approved calibration service, in accordance with the requirements of this section?
- 315.05(e1a) Has a control strip been constructed for each roadway, shoulder course, and each life of each course as required?
- 315.05(e2)2 Have the rollers continued until roller marks are eliminated and the required density has been obtained?

## *CITP JOB BOOK - 300 SERIES*

- 315.05(e 1 b) Have the required number of density tests been taken by the contractor on specified courses?
- 315.05(f)1 Has a transverse joint been cut on the previous run as specified?
- 315.05(f)2 Has a brush coat of asphalt been applied to transverse joints as directed?
- 315.05(f)3 Have joints adjacent to curbs, gutters, or adjoining pavement been set up to a height sufficient to receive full compression under the rollers?
- 315.06.1 Has the Contractor cut the testing samples and replaced the material as required?
- 315.07(a)2 Has the Contractor taken corrective actions to fix areas out of tolerance?
- 315.07(b) Does the thickness of the base course meet the requirements?

*CITP JOB BOOK - 300 SERIES*

**ROADWAY CONSTRUCTION**

**CONCRETE TESTING**

<b>Job Element</b>	<b>Date</b>	<b>Project Inspector's Signature</b>
Properly uses the following testing equipment during placement of hydraulic cement concrete (including caring for the equipment after use):		
1. Protex Air Meter		
2. Slump Cone		
3. Thermometer		
4. Concrete Cylinder Molds		
Explains the proper steps to take whenever a test failure occurs with the following testing equipment:		
1. Protex Air Meter		
2. Slump Cone		
3. Thermometer		
4. Concrete Cylinder		

**ROADWAY CONSTRUCTION**

**CONCRETE TESTING**

General description of how competencies were completed:

Trainee's Comments:

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Project Inspector's Comments:

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