



Illinois Department of Transportation

# **DOCUMENTATION OF CONTRACT QUANTITIES**

SPECIFIC TASK TRAINING PROGRAM

S-14

*Conducted by the*

ILLINOIS CENTER FOR TRANSPORTATION (ICT)  
AND  
IDOT BUREAU OF CONSTRUCTION

## **FY 2026**



## **LINKS**

Illinois Center for Transportation (ICT) Doc Class Training Information

Illinois Department of Transportation

Standard Specifications, Supplemental Specifications and Recurring Special Provisions, Construction Manual, Highway Standards, Construction Inspector's Checklists, Project Procedures Guide, IDOT Forms, Work Zone Safety Materials, etc.

Pay Item/ Material Conversion Report

IDOT Materials- Qualified Product Lists

## **DOCUMENTATION CLASS INSTRUCTOR**

Greg Renshaw (ICT Doc Class Coordinator).....IL. Center for Transportation.....grenshaw@illinois.edu....(217-300-6375)

## **IDOT DOCUMENTATION CONTACT**

Douglas Dirks.....IDOT Central Bureau of Construction.....Douglas.Dirks@illinois.gov







# **Section A**

## GENERAL REQUIREMENTS



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The policies contained in this section represent the minimum documentation required statewide. Each District may require additional documentation due to conditions specific to the District.

### **USE OF THE ICORS FOR DOCUMENTATION**

Project records are now maintained on a computer-based system known as the Illinois Construction Records Systems (ICORS). ICORS gives the Resident a computerized Diary and Quantity Book, as well as allowing the generation of a number of documents and reports that replace manually generated reports.

The Documentation procedures for ICORS are the same as for non-ICORS projects, i.e., field books, IDR's, etc. as indicated on under Final Documentation.

#### ICORS Project Diary (Example page F-3)

Documentation Policy requires the resident's name and signature, and the names and initials of personnel assigned to the project, to be written on the first page of the project diary. In ICORS, this can be accomplished by printing the ICORS diary cover page, and writing the information by hand on that cover sheet. This page is then to be kept in the project files.

If anyone other than the resident makes entries in the diary, they must type in their full name at the end of the day's entry.

The project diary is kept in the ICORS data base, but you must also print the new entries at least weekly. The printed diary pages are to be kept with the signed cover sheet in the project records. An acceptable alternative to this method is to save a snapshot file and store this data on a different CD other than where the contract data is backed up.

#### Weekly Reports (Example page F-4)

Weekly Reports must be generated every week for Completion Date projects and every week for Working Day contracts not in suspension.

#### Daily Quantities (Example page F-9)

Quantity documentation is kept on separate source documents (i.e. IDR's, field books, tickets, etc.), and the Daily Quantity (DQ) entry is used only as a means of making entries into the ICORS Quantity Book. The DQ is not a source document. DQ entries must be printed at least weekly and kept in the project records. An acceptable alternative to this method is to save a snapshot file and store this data on a different CD other than where the contract data is backed up.

#### Quantity Book (Example page F-10)

The Quantity Book is generated only by entries on DQ's. The Quantity Book, the Cover Sheet and the Scale Report must be printed at the end of the project.

Pay Estimates

ICORS Pay Estimates are submitted by e-mail unless the estimate includes a new material allowance. Be sure to check the test estimate prior to submitting the real pay estimate. Do not send the same estimate twice, and do not send consecutive pay estimates within less than five days.

Material Allowances

Material Allowances are generated in ICORS. For new material allowances or additions to existing material allowances, pay estimates must be sent by mail (not email). For these two cases, the hard copy of the estimate, BC-131, BC-49, and invoices must all be submitted together by mail. Subsequent estimates (material allowance decreases or stays the same) should be emailed with the BC-131 file included in the e-mail submittal.

Authorizations

Change authorizations are to be created in ICORS. A complete explanation of the reason for change is necessary for authorization approval. Use a separate attached sheet for this explanation if necessary.

Final Copies

When the project is complete, the following documents should be stored with the job records.

1. A complete hard copy of the Diary. The signed and initialed diary cover sheet must be stored with the complete Diary output.
2. A complete hard copy of the Quantity Book.
3. 2 CD copies of the contract data file.

ICORS Backups

In accordance with Departmental Order 8-2, 4.C.5, users of agency microcomputer systems (including laptops) are responsible for backing up data files stored on local microcomputer disk drive (e.g. C/ drive). The required frequency for backups to be done is any time data files have been appended, altered, modified or created. For personnel using ICORS, a backup must be made once a day any day data is entered into ICORS and a record of this backup must be kept on or with Form BC 2331, ICORS PC Backup Schedule. Detailed instructions are included with Form BC 2331.

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## PROJECT DIARY

The Project Diary is one of the most essential records kept on the job. The Resident or a designated representative is required to keep a daily diary on each contract.

The diary must be a bound hardback book, unless using ICORS or CMMS. There must be a separate diary for each contract. Journal type entries must start at the beginning of the diary book. All entries must be in order by date. (No wrap around entries will be allowed.) Preprinted dates may be modified. All entries throughout the diary must be in ink.

The first entry in the diary must include the year, the name and signature of the Resident (and designated representative, if applicable), the complete official designation of the section, and the name of the Contractor. (Example page F-1) This may seem nonessential, but diaries have been thrown out of court because they were not properly identified.

The District's (or Local Agency's) return address must be noted on the title page so that it may be returned if it is ever lost.

A list of all personnel assigned to the job or who work on the job shall be entered in front of diary (print full name). Each person shall put his/her initials after his/her name.

An entry must be made in the project diary for each day of the project, including weekends and holidays, except when the project is officially suspended. Entries must begin by the official start date or when the Contractor begins work, whichever is first. (Example page F-2)

The diary need not repeat the detailed entries reported on the Inspectors' daily field inspection reports but should contain only general information about these operations. The diary should contain a day to day record of all significant items relating to the project. Since it may become important evidence in future claims or litigation it is essential that the diary be complete.

The diary shall not be used as a Quantity Book or field book; only a reference to the work in progress is sufficient.

A complete legible diary will be accepted in court if the need arises. Diary entries made by the Resident do not need to be signed or initialed. Only entries in a project diary made by someone other than the Resident or designated representative need to be signed by the person making that entry.

Information entered in the diary must never be erased, whited-out, or eradicated in any manner. To correct information already entered, cross out information to be changed. The information changed should be initialed and dated by the person making the change.

A partial list of items to be noted in a project diary is:

1. Weather – project location specific (how the weather affects the controlling item of work).
2. Progress Schedule Controlling Item of Work and actual work done by Contractor's forces during the day.
3. Number of persons working. (The entries should contain enough information to supplement your required monitoring of DBE activities as per 49CFR 26.37(b) of the Code of Federal Regulations).
4. Working days charged (working day contracts), workable days charged (completion date contracts) and reason for partial or non-working/workable days.
5. Traffic control inspections and changes.
6. Important orders, discussions, or meetings with Contractor.
7. Official visitors and inspections.
8. Opening or closing detours, lane closures, changes in lane closures.
9. Work or materials rejected and reasons.
10. Time of shutting down or resuming of work and explanations.
11. Account of any time spent by Contractor's workers or equipment on disputable items of work.
12. The presence of railroad flaggers and whether the Contractor is to be reimbursed for their services.
13. Length and cause of any delay.
14. Arrival and departure of major equipment.
15. Record of important faxes and telephone calls.
16. Unusual conditions, if any, such as high water, bridge failures, slides, accidents/injuries, etc.
17. Approval for extra work, unless documented elsewhere, such as a prior approval authorization (BC 2256) or an RE memo attached to the authorization for the extra work pay item.
18. Field review with prime and affected subcontractor personnel to determine the timing and placement of erosion/sediment control measures per Construction Manual Section 280 for projects involving these measures.
19. Discussion regarding any specific safety related instruction given to field staff.

At the completion of the project, the diary shall be filed as part of the permanent job records.

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## THE QUANTITY BOOK

Instructions pertaining to contract quantities are found in Article 104.02 and Section 109 in the Standard Specifications and the Method of Measurement and Basis of Payment articles for each construction pay item.

For each contract you will be issued a Quantity Book in which contract items are to be posted. The Quantity Book is to be considered the keystone of the complete record keeping structure you will be building in the field. The daily quantities posted here will be referred to when each pay estimate is prepared. (Note: For projects using CMMS, the Quantity Book shall be electronic within CMMS.)

**Title Page (Form BC 623)** – Example page F-5. The title page in the Quantity Book shall either be filled in by a rubber stamp, typewriter or neatly printed in ink. For state-run projects, the “Address” at the bottom of the page refers to the District in which the project is located. For Local Agency projects (county, city etc.) the address should be that of the local agency.

**Index of Sheets (Form BC 624)** – Example page F-6. The computerized index is prepared in the same item-to-item order as the first pay estimate. If additional line items are later added to the contract, they can be added at the end of the index, under the appropriate fund type.

**Quantity Record (Form BC 625)** – Example page F-7. The job designation block and the upper left-hand side of Form BC 625 will be filled in by a computer run following project award. A separate filled in sheet will be provided for each pay estimate line item. These extra sheets will require the Resident to fill in by hand the complete job designation and quantity information. The lines provided for authorization additions and deductions are to be filled in as authorizations are submitted and approved. The final total quantity in the authorization box should be identical to the final measured and approved amount completed and accepted.

The column headed “Date” should be the dates the quantity was placed.

The “Station to Station, Location, or Description” shall describe the actual area where this item was placed.

Quantities placed are to be kept daily when this particular pay item is constructed. The column “To Date” shall show the accumulative total of this item as additional days of work are entered. This will facilitate the checking of material inspection reports and plan quantities for additions and deductions so that BC 22's may be kept current.

When the pay item is complete, the quantity shall be marked final after the last entry on the quantity book page.



“Evidence of Material Inspection” – An entry must be made in this column each time an entry is made in the quantity column. Evidence of material inspection, as described in the *Project Procedures Guide*, shall be such items as a State of Illinois stamp number, inspection report, plant report, or other information, written or verbal, to indicate that the material is satisfactory. When the information is verbal, it should be recorded in the Project Diary. The Resident should follow up any verbal approvals with written acceptance verification for his/her project files. The evidence of inspection required in the *Project Procedures Guide* should be strictly adhered to for both Progress and Final Documentation and must lead to a verifiable source of the information required. All delivery tickets shall be retained in the project files.

Also, the District’s Certification of Materials, which is prepared when the project is finalized, can be expedited if the inspector would list under “Evidence of Material Inspection” such additional information as: the name of the plant, quarry or manufacturer of the material together with any identifying marks, imprints, or tags on the material. In any case, the name of the producer of the material must either be noted in this column, or cross-referenced in the project files. For example, if evidence of material inspection is noted only as “Approved Source & Tickets,” then the producer’s name must be noted on the delivery tickets. If the producer’s name is not noted on the tickets, then it must be noted with the evidence of material inspection in the Quantity Book.

“Source of Progress Documentation” – Except for Lump Sum, Each, and Calendar Month items, each entry in the Quantity Book must be supported by either progress or final documentation. This column is to be used to cross reference to the source document. The Quantity Book is the start of the audit trail for all information required to support all progress and final payments for each item.

“Source of Documentation for Final Quantity” – Except for Each, Lump Sum, and Calendar Month items, this area must sufficiently identify the source documents which support the final quantity for this item. This area shall also be used to cross reference to other supporting documentation such as depth checks.

**Inspection Reports (Form BC 625)** – Example page F-8. On the opposite side of Form BC 625, within the block titled INSPECTION REPORTS, it is acceptable to record a statement such as “See MISTIC Form MIRC08, file” or directly log the quantity. Periodically, the quantities of materials shown on these MIRC08 printouts should be compared to the quantities actually used. The District Materials section should be contacted if insufficient quantity of inspected material is being assigned to your project.

For items in which a weight scale is used to determine the final quantity, the top of this page will be used to record the information on the scale decal placed by the *Department of Agriculture*. (See Documentation of Pay Quantities based on Weight Tickets)

## FIELD INSPECTION REPORTS/SOURCE DOCUMENTATION

Each inspector is to provide a concise, accurate, daily account of the contractor's work so it may be recorded and furnished to the Resident at the end of each working day. This record is to be completed by the inspector actually doing the inspection for the Resident and filed in project records. This record may be documented using any of the appropriate documents listed under Final Documentation later in this section.

Source documentation is required for all quantities of work for which payment will be made. The source document shall contain all information necessary to identify the contractor or subcontractor performing the work, date work as completed, location of work, quantity of work completed and depth checks (if required). The document can also be used to record material inspection. The source document shall also contain initials and dates for all parties involved in inspecting and measuring the work and calculating and checking the quantity of work completed. This information may be documented using any of the appropriate documents listed under the Final Documentation later in this section.

When the BC 628 Inspector's Daily Report/IDR (Example page F-23) is used to document the work, the completed BC 628's shall be kept in chronological order and filed in a binder.

When a field book is used to document a pay item, all quantities for that particular pay item should be kept in consecutive pages in the field book, and the field book index kept up to date.

When a calculation file is used to document a pay item, all quantities for a particular pay item shall be kept in consecutive pages and filed, with pay item number and cross references clearly marked. In addition, if an individual document includes more than one (loose-leaf) page, then each page should indicate that it belongs to the same document. This could be indicated, for example, by noting such information as the date, IDR number or "page \_ of \_."

When weight tickets are used to document a pay item, all tickets pertaining to that pay item shall be kept separately from other project tickets (i.e. separate envelopes).

## FIELD BOOKS

All field books that are to become part of the permanent job records will conform to the following:

1. The field books will be hard cover bound books.
2. The inside cover must show the complete project designation (job stamp) and the return address for the District (or local agency).
3. If more than one field book will be included in the projects records, the cover must also show identification (for example, F.B. #1) for cross-referencing purposes. The outside cover also should show the project designation.
4. An index of pages must be completed for the final records. The index must contain enough detail to show the reviewer the contents and general location of the contents in the field book. (Example page F-11)

Use of a field book is required for:

1. Permanent survey records, layout records and cross-sections
2. Concrete Superstructure pour summary (Example page F-12)

Field Book required when not using forms:

3. PC Concrete paving summary (Example page F-13), or Form BC 2531 (Example page F-15, 16)
4. Hot-Mix Asphalt (HMA) paving summary (Example page F-14), or Form BC 2529 (Example page F-17,18)

QC/QA projects do not eliminate the documentation requirements above for PCC and HMA Paving. The use of field books for other types of records is optional.

## INITIALS AND DATES

All documents will include the initials of the person (or persons) who performed each of the tasks involved in inspecting and documenting the work, as well as the date (or dates) each task was performed. "Inspected by" initials and dates are optional. "Measured by", "Calculated by" and "Checked by" are required. Initials and dates must be hand-written on all hard copy source documentation. Each person will initial his/her own work, except that when more than one person performs the same task, one of those persons may also record the initials of each of the other persons involved in that task.

Electronic initials and dates are allowed on electronic source documents in the Construction Materials Management System (CMMS).

When a document refers to another document, the referencing document does not need to repeat the initials and dates shown on the referenced document.

## PLAN QUANTITY ACCEPTANCE, Example pages F-20-22

As stated in Article 109.02, payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished in accordance with the contract. Most final pay quantities will be based directly on measurements and calculations performed by the Resident in the field. However, for a number of pay items, the Method of Measurement specified in the contract documents allows the Department and the Contractor to agree in writing that the plan quantity is accurate and will be used for the final quantity; see Article 202.07(a).

This agreement is based on three points: (1) the plans accurately reflect the existing jobsite conditions, insofar as existing conditions will affect the final quantity of the agreed to items; (2) the plan quantity was accurately calculated; and (3) the work will be built to the lines, grades and dimensions shown on the plans, insofar as they pertain to the pay quantity of the agreed to items.

Form BC 981, Agreement on Accuracy of Plan Quantities is to be used for this agreement. This form lists most of the items in the Standard Specifications for which agreement to contract quantities is permitted. Extra spaces are available on the form for other items allowed by the contract documents. Form BC 981M may be used for metric contracts. In accordance with the Specifications, this agreement must be in writing for any given item before any work is started which would affect the measurements for that item.

The main purpose of the BC 981 is to save the Resident time in documenting the accuracy of the final quantity paid to the contractor. The BC 981 is an acknowledgement that for certain items, at least, it is possible to determine during the design phase accurate final pay quantities. The Regional Engineer's signature on the BC 981 indicates that the Regional Engineer is satisfied that with the quality controls in place in the district the quantities agreed to are accurate.

Even with these controls, however, errors are still possible, and the Specifications make two provisions for this. First, if the plans have been altered or some other development arises which calls into question the applicability of the plan quantity, either party has the right to request in writing and thereby cause the quantities involved to be measured.

Second, if an error has been discovered after the work has started, then that portion of the quantity which is affected by the error will be measured and the final quantity will be adjusted accordingly. In order for this provision to apply, however, the plans must distinguish where the individual quantities apply. This situation could arise, for example, if the plans indicate the quantity of trench backfill required for each run of storm sewer. If the layout for one of the runs is altered then the trench backfill would have to be measured for that run only, and the final quantity for trench backfill would be adjusted by the measured difference for that run.

For items agreed to, the source of documentation for final quantity noted in the Quantity Book will be "BC 981." If errors are found or changes are made to the plan quantity after the work has begun on an agreed item, adjustments to the plan quantity must be documented with appropriate measurements. The final pay quantity will then be the agreed plan quantity plus or minus the documented adjustment to the plan quantity. In this case, the source of documentation for final quantity noted in the Quantity Book is the BC 981, as well as the measurements and calculations used to document the adjustment to plan quantity.

Even though the BC 981 is signed in the office, the Resident is responsible for administering the agreement correctly. When the Resident cites the BC 981 as the source of documentation for the final quantity, the Resident is stating that the three points mentioned above have been satisfied. The BC 981 is merely an alternate means of documenting the accuracy of final pay quantities; it does not mean that the Resident can ignore the actual quantities of work performed.

As the work progresses on the agreed to items, the Resident should be aware of how the estimated progress quantities compare to the plan quantities. If the estimated payments are disproportionate to the Contractor's actual progress on the items, then the Resident should investigate the reason for the discrepancy.

For some of the items for which the Standard Specifications allow agreement to contract quantities, such agreement may not be appropriate in all situations. In general the following restrictions apply:

- Granular backfill, such as PGE, for undercuts must be measured by before and after cross sections. If the plan quantity for excavation includes undercut for PGE, then the excavation quantity may be agreed to only if the plans distinguish the undercut quantity from the rest of the excavation. In this case, the estimated undercut quantity should be noted on the BC 981, and it will be adjusted for the actual measured quantity.

- If the plans contain both earth and rock excavation, and they are contiguous, plan quantities cannot be accepted for the rock excavation unless the unit prices for earth and rock excavation are the same. Otherwise, it will be necessary for the actual quantity of rock excavation to be determined by before and after cross sections. Then, the previously agreed plan quantity of earth excavation will be adjusted by the measured difference in rock excavation. As with the undercut example above, the plan estimate for rock excavation should be noted on the BC 981.
- Plan quantity shall not be agreed to for any item for which the unit of measure is TON (M TON).

## PROGRESS DOCUMENTATION

In order to properly document the quantities shown on partial payment estimates, progress entries in the Quantity Book are required. These daily quantities can be based upon either estimates or final measurements. In either case, progress documentation must be kept on file (preferably on the Inspector's Daily Report or in a field book) to indicate how the quantity was established. Make cross-reference notes in the Progress Documentation Source column of the Quantity Book.

The following guidelines can be used in establishing estimated quantities. Quantities that are estimated should be labeled as such. If a method other than one of those shown below is used to estimate a quantity, the method must be documented, clear and reasonable.

### **Excavation Pay Items** – cubic yard (cubic meter)

Example pages D-1, F-23, 24

- (1) Estimate percentages of plan balance quantities
- (2) Upgrade quantities as balance volumes are completed, or
- (3) Use load counts, when available. Use 80% of struck capacity.
- (4) Other.

### **Concrete Items** – cubic yard (cubic meter)

Example page F-26

- (1) Extract the daily volumes from your Computation Check file
- Or
- (2) Use a reasonable percentage (typically 90%) of actual delivered concrete.
  - (3) Upgrade each completed structural item with the plan Bill-of-Materials quantity
  - (4) Other.

**Reinforcement Bars** – pounds (kilograms)

Example page F-26.

- (1) Establish a lbs/yd<sup>3</sup> (kg./m<sup>3</sup>) factor from plan quantities; use it as concrete volumes are placed or as the bars are tied in place.
- (2) Upgrade each completed structural item with the plan Bill-of-Materials quantity
- (3) Other.

**Pipe Pay Items** – feet (meter)

Example page F-27

- (1) Count and record pipe sections as installed.
- (2) Upgrade completed runs with plan quantities

**Length and Area Pay Items** – feet, sq. ft., and sq. yd. (meter and sq. meter)

- (1) Base computations on paced dimensions
- (2) Station to Station staked dimensions
- (3) Plan quantity schedules

**Sodding** – sq. yd. (sq. meter)

- (1) Pay 25% upon placement of sod
- (2) Pay 75% upon acceptance of sod
- (3) Refer to Article 252.12 and 252.13

**Each and Lump Sum Items**

If payment is to be made when the item is partially completed, record station or location, date and estimated percentage of completion in the Quantity Book.

For **Traffic Control** items, the following procedure is to be used to estimate progress payments (Example page F-28):

- Except for temporary bridge or traffic signals, when the traffic control devices required by the standard or special provision are installed, pay 25% of the lump sum (or each) bid price. On subsequent pay estimates, prorate 65% of the price, based on the actual vs. expected time of usage according to the progress schedule. When the devices have been removed the remaining 10% will be paid.

When it appears, (due to less than anticipated quantities of work performed), a negative adjustment to a traffic control pay item will be required per Article 701.20 (a) of the SSRBC, the Engineer shall make appropriate adjustments to the estimated progress payments noted above, in order to minimize the amount of overpayment to the contractor, until such time as final payment and required adjustments for the traffic control pay item are determined.

- For temporary traffic signals and temporary bridge signals, pay 60% after initial installation is complete and the signals are operating. The remaining 40% will be paid after the temporary signal installation has been completely removed.

### **Blasting Residue Containment Disposal**

(Lump Sum) includes numerous contractor submittals, preliminary testing, specialized equipment, regulated disposal and extensive documentation, so the contractor is to be paid in accordance with the following schedule. However, the full amount should not be paid until all of the required disposal documentation has been submitted to the Engineer.

- Pay 30% on the first day of paint removal operations
- Prorate 50% as removal is completed
- Pay final 20% when all disposal documentation has been completed and the final testing is completed.

### **Topsoil Excavation and Placement** (Example page F-29)

Since this pay item pertains to that material obtained from within the limits of the right of way and is measured in cubic yards (cubic meters) in its original position, for progress documentation purposes it may be necessary to pay 50% of the volume computed by method of average end areas in its original position upon completion of the excavation. The remaining 50% of the volume shall be paid after the placing and finishing of the topsoil to the lines, grades, and the minimum thickness shown on the plans.

## **ITEMS THAT MUST BE FINAL MEASURED**

While payments for most items can be estimated under some circumstances (see Construction Manual Section 109), some types of work require that the final measurements be taken each day. Information needed to determine final quantities for such pay items must be obtained at the time the work is done as it will be difficult or impractical to compute quantities with the acceptable accuracy at a later date. Examples: removal items, piling, most weight ticket items, trench backfill, and similar items which, when covered, are impossible to measure later.

### **USE OF COMPUTERS FOR FINAL DOCUMENTATION** (Example page F-30, 31)

The use of computers to determine final quantities is encouraged especially for excavation quantities, reinforcement bars and area items. If computer printouts are used to support pay item quantities paid, the following information is required for proper documentation:

- A. Compiled calculation programs verified and approved for use by the District.
  1. Pay item number and description, with contract number (or job stamp).
  2. Printout of the input data, initialed and dated by the person who checked the input;

3. Hard-copy of the results.

B. Electronic spreadsheets

1. Printout of the spreadsheet. The printout must show:
  - a. Pay item number and description, with contract number (or job stamp).
  - b. Input data
  - c. Description of how the results are calculated (e.g. sample formulas)
  - d. Calculation results, with page subtotals (if applicable)
  - e. Cross-references to any other referenced documents
2. The hard-copy of the spreadsheet must be manually initialed and dated by:
  - a. The person who prepared the spreadsheet, and
  - b. The person who checked the spreadsheet printout or the person who checked the formulas embedded in the spreadsheet. (i.e. "Prepared by:" and either "Checked By" or "Formulas Checked By" initials and dates.)

In addition, if field measurements are entered directly in the spreadsheet, the printout must include "Measured By" initials and dates.

- C. Other programs, not verified and approved for use by the Department. Because the Department has no way of knowing the accuracy of other programs, the following general rules apply:
1. A record of the original field measurements (if applicable) must be included in the project files.
  2. The measurements, or a computer-interpolated version of the measurements, must be in the same format as would normally be required if the measurement had been recorded manually (e.g. station, offset and elevation for cross-section data, or length and width for rectangular field measurements). In other words, the raw data must be in, or be put in, a format that could be understood by the reviewer;
  3. The program must be identified, including version numbers;
  4. Input data, if entered manually, must be checked;
  5. The preparer may be required to demonstrate that the results are correct. This may be accomplished by manually calculating a sample of the results, under the supervision of the Department.
  6. All other documentation requirements shall apply.

The documentation for each item shall be kept on file and marked with the item number for easy cross reference.



**EXTRA WORK (ARTICLE 109.04)**

Extra work will be paid for at either the contract price, a lump sum price or agreed unit prices, or on a force account basis. (See Construction Memorandum No.9, "Force Accounting Article 109.04" and Construction Memorandum No. 4, "Authorization of Contract Changes Articles 104.02 and 109.04")

Agreed Unit Price Items:

To establish a new unit price item will require a copy of the correspondence from the Contractor and an answering authorization from the Engineer. A memorandum from the District Estimator agreeing with the Contractor's proposed unit prices is also necessary. In order to expedite the review and processing of an AUP request by the District Estimator, if higher than typical bid prices for a given type of work effort are requested by the contractor, justification for the higher costs (confined work area, lower production rates, small quantities, limited availability of material, etc.) should be clearly documented in the contractor's request.

Force Account:

The Engineer must have copies of:

- (a) Proper authorization.
- (b) Daily copies of Form BC 635, Extra Work Daily Report, prepared by the Resident or Inspector, jointly signed with the contractor, recording labor, equipment, and material used. In limited cases, more than one day's work will be allowed on a BC 635, but only when the workers, equipment and time do not change from day to day.
- (c) Contractor's bill. The format should be in accordance with the sample bill shown in Construction Memorandum No. 9, Force Account Billing.
- (d) Balancing authorization.

**MATERIAL ALLOWANCE**

Example page F-32 & F-33. Payment may be made for materials such as fabricated structural steel on the basis of a material allowance if the Contractor requests payment for materials in storage. (See Article 109.07 of the Standard Specifications, and Construction Manual Section 109).

The pay estimate should be accompanied by Form BC 49, Materials Allowance Affidavit; Form BC 131, Statement of Material Allowances; and material supplier invoices and freight bills.

Within 60 days of payment to the Contractor we need copies of proof that the Contractor has paid for the material. Rubber stamp "Paid" will not do. In the event the Contractor does not provide the Resident with proof of payment (copy of cancelled check or copy of paid invoice signed and dated) for the material within 60 days of receipt of the payment, the dollar figure entered on the next pay estimate should be reduced by the value of the subject material. As a rule of thumb, the Resident may use a time limit of 70 days from the date the pay estimate was mailed, to account for processing time and time spent in the mail. See the Forms Section for specific instructions for preparing Forms BC 49 and BC 131.

## MAXIMUM PAYMENT

Example page F-34, 35. Throughout the Specifications there are numerous references to pay items on which final payment cannot be made for more than \_\_\_% of the amount specified by the Engineer. The following is a listing of Pay Items and the applicable percentages that limits maximum payment. (Generally, maximum payment percentages apply only to those Pay Items paid for on the basis of volume or weight.)

### Items With “Maximum Pay” Percentages

|   |                    |      |
|---|--------------------|------|
| NITROGEN FERT NUTR                        | POUND (KILOGRAM)   | 103% |
| PHOSPHORUS FERT NUTR                      | POUND (KILOGRAM)   | 103% |
| POTASSIUM FERT NUTR                       | POUND (KILOGRAM)   | 103% |
| AGG SHLDS (A or B)                        | TON (M TON)        | 108% |
| AGG SURF CSE (A or B)                     | TON (M TON)        | 108% |
| AGG BASE CSE (A or B)                     | TON (M TON)        | 108% |
| AGG BASE CSE REPAIR                       | TON (M TON)        | 108% |
| INCIDENTAL HMA SURFACING                  | TON (M TON)        | 103% |
| HMA BIND CSE                              | TON (M TON)        | 103% |
| HMA SURF CSE                              | TON (M TON)        | 103% |
| MIX FOR CR, JTS & FLGWYS                  | TON (M TON)        | 103% |
| LEVEL BIND (MACH & HAND)                  | TON (M TON)        | 103% |
| BIT MATLS (PRIME CT)                      | GAL or TON (LITER) | 105% |
| BIT MATLS (TACK COAT)                     | POUND              | 105% |
| BIT MATLS (COVER & SEAL CTS)              | GAL or TON (LITER) | 105% |
| COVER COAT AGG                            | TON (M TON)        | 110% |
| SEAL COAT AGG                             | TON (M TON)        | 110% |
| GRANULAR EMBANKMENT SPECIAL               | TON (M TON)        | 108% |
| POROUS GRANULAR EMBANKMENT                | TON (M TON)        | 108% |
| AGRICULTURAL GROUND LIMESTONE             | TON (M TON)        | 108% |
| SUBBASE GRANULAR MATL,<br>TY (A, B, or C) | TON (M TON)        | 108% |

Daily yield checks should be run on these items so that the Contractor can be notified when he/she is exceeding the maximum specified amounts of quantity. The limit of the final amount paid shall be plan quantity plus (or minus) theoretical quantities approved by authorization, multiplied by the above percentage.

### YIELD CHECKS (Example page, F-14)

A yield check is a calculation to determine if the correct amount of material was used in the work:

$$\text{Yield (\%)} = \frac{\text{Quantity of material delivered}}{\text{Theoretical quantity required}} \times 100$$

Frequent yield checks are a good engineering practice, and they may help uncover problems in the work early in the project. Yield checks documented by inspectors provide a timely and valuable source of information to the Resident.

While performing yield checks are highly recommended for all materials used in the work, they are required to be documented for the following items:

| <u>Item</u>        | <u>Frequency</u>               |
|--------------------|--------------------------------|
| HMA Paving         | Frequently, each day of paving |
| PC Concrete Paving | At end of each day of paving   |

Also, many items include materials for which the contract specifies the application rate of the material. Ensuring the correct application of such a material is an important part of inspecting and approving the pay item work. The Resident's signature on the pay estimate assures the Department that the materials and procedures used were in accordance with the specifications for each pay item paid for on that estimate. Application rates are recommended, but not required, to be documented explicitly. However, there must be enough information in the project records that the application rate can be verified if the need arises.

### THICKNESS DETERMINATION SCHEDULE (Example page, F-36)

In order to clarify the requirements for thickness determinations, we have compiled data from the *Project Procedures Guide*, the Standard Specifications and the Supplemental Specifications into an attached Thickness Determination Schedule. The Schedule refers to the specification article, the minimum frequency for making checks, the source documents for recording the thickness and the method of measurement. It should be pointed out that minimum checking may not be sufficient to verify plan thickness and should be increased as conditions dictate. There are many time-honored engineering methods for determining thickness; i.e., before and after rod and level shots, before and after stringline measurements, direct probe, and measurements of density holes. All are acceptable. **Blanket statements such as "all sidewalk was 4 inches (100mm) or deeper" and "all patches were 9 inches (225 mm)" are NOT acceptable. Actual measurements must be recorded.** In addition, some items such as full-depth HMA and PCC pavement require that cores will be taken and measured by other than project personnel. This coring will be the responsibility of the Contractor, at locations determined by the Resident. (See Construction Manual Art. 407.10-4(b)).

Thickness deficiencies identified by the Resident during construction should immediately be brought to the attention of the Contractor and corrective actions taken. Thickness deficiencies identified during coring will require adjusted prices or removal and replacement per the Standard Specifications. Large contract deductions or removals are the Department's last resort and are a source of embarrassment to both the Contractor and the Department. Special care must be exercised in urban, curbed areas where corrective actions are limited.

The schedule also includes miscellaneous items marked "All Others." This category covers many square foot and square yard (square meter) and foot (meter) items. Control and documentation of the depth of these items are also very important and should be handled in the same manner as all other items listed.

The location of where the thickness determinations were taken, along with the results, should be clearly noted on the source document. The location of the source document, whether it be field books or IDRs, must be clearly indexed and referenced through the Quantity Book. Many of the problems encountered in verifying thickness checks are in the locating and identifying them in the project records. Please have the source document properly cross-referenced.

Thickness determinations are a department policy requirement. The use of proper procedures for thickness determinations will significantly reduce the chances for unacceptable work.

| TYPE OF<br>CONSTRUCTION | SPEC.<br>REFERENCE | MINIMUM<br>FREQUENCY | DOCUMENT<br>RECORD | METHOD<br>OF MEAS. |
|-------------------------|--------------------|----------------------|--------------------|--------------------|
|-------------------------|--------------------|----------------------|--------------------|--------------------|

#### BASE COURSES

|                     |                     |                       |             |               |
|---------------------|---------------------|-----------------------|-------------|---------------|
| Agg Base Course     | 351.06              | 1000 lf (1 per 300 m) | F.B., IDR   | <u>1/</u>     |
| PCC Base Course     | 420.15 &<br>C.M. 43 | 250 lf (1 per 75 m)   | F.B., IDR * | <u>1/, 2/</u> |
| PCC Base Course     |                     |                       |             |               |
| Widening (under 6') | 354.09              | 1000 lf (1 per 300 m) | F.B., IDR * | <u>1/, 2/</u> |
| HMA Base Course     | 355.09              | 250 lf (1 per 75 m)   | F.B., IDR * | <u>1/, 3/</u> |
| HMA Bse Cse Wid.    | 356.07              | 250 lf (1 per 75 m)   | F.B., IDR * | <u>1/, 3/</u> |
| Soil – Cement       | 352.17              | 1000 lf (1 per 300 m) | F.B., IDR   | <u>1/</u>     |

#### SUBBASES

|                        |        |                       |           |                |
|------------------------|--------|-----------------------|-----------|----------------|
| Subbase Gran Matl      | 311.07 | 1000 lf (1 per 300 m) | F.B., IDR | <u>1/</u>      |
| HMA Agg Mixture        | 312.14 | 250 lf (1 per 75 m)   | F.B., IDR | <u>1/, 10/</u> |
| Cement Agg Mixture     | 312.14 | 250 lf (1 per 75 m)   | F.B., IDR | <u>1/, 9/</u>  |
| Pozzolanic Agg Mixture | 312.14 | 250 lf (1 per 75 m)   | F.B., IDR | <u>1/, 9/</u>  |
| Cement Agg. Mixt. II   | 312.14 | 250 lf (1 per 75 m)   | F.B., IDR | <u>1/, 9/</u>  |

#### PAVEMENT & SURFACE COURSES

|                    |                          |   |             |               |
|--------------------|--------------------------|---|-------------|---------------|
| Agg Surface Course | 402.06                   | 1000 lf (1 per 300 m)                       | F.B., IDR   | <u>1/</u>     |
| PCC Pavement       | 420.15 &<br>C.M. 43      | 250 lf (1 per 75 m)                         | F.B., IDR * | <u>1/, 4/</u> |
| HMA Full Depth     | 407.10                   | 250 lf (1 per 75 m)                         | F.B., IDR * | <u>1/, 5/</u> |
| Pavement Removal   | 440.07 &<br>Suppl. Specs | 1 per location or when<br>thickness changes | F.B., IDR * | <u>1/</u>     |

#### SHOULDER

|               |        |                       |             |               |
|---------------|--------|-----------------------|-------------|---------------|
| Agg Shoulders | 481.06 | 1000 lf (1 per 300 m) | F.B., IDR   | <u>1/</u>     |
| PCC Shoulders | 483.07 | 250 lf (1 per 75 m)   | F.B., IDR * | <u>1/, 7/</u> |
| HMA Shoulders | 482.06 | 1000 lf (1 per 300 m) | F.B., IDR   | <u>1/, 8/</u> |

| TYPE OF CONSTRUCTION  | SPEC. REFERENCE | MINIMUM FREQUENCY                   | DOCUMENT RECORD | METHOD OF MEAS. |
|---|-----------------|-------------------------------------|-----------------|-----------------|
| <u>PATCHING</u>   |                 |                                     |                 |                 |
| HMA Patching  | 442.11          | 1 per patch                         | F.B., IDR       | <u>6/</u>       |
| PCC Patching  | 442.11          | 1 per patch                         | F.B., IDR       | <u>6/</u>       |
| <u>ALL OTHERS</u>   |                 |                                     |                 |                 |
| PCC Sidewalk  | 424.13          | 1000 sf (1 per 100 m <sup>2</sup> ) | F.B., IDR       | <u>1/</u>       |
| PCC Slopewall   | 511.06          | 1000 sf (1 per 100 m <sup>2</sup> ) | F.B., IDR       | <u>1/</u>       |
| PCC Median  | 606.15          | 1000 sf (1 per 100 m <sup>2</sup> ) | F.B., IDR       | <u>1/</u>       |
| PCC Curb, Gutter, Combination Curb & Gutter   | 606.15          | 250 lf (1 per 75 m)                 | F.B., IDR       | <u>1/, 11/</u>  |
| PCC Paved Ditch   | 606.15          | 250 lf (1 per 75 m)                 | F.B., IDR       | <u>1/</u>       |
| Top Soil  | 211.08          | 2500 SY (1 per 2090m <sup>2</sup> ) | F.B., IDR       | <u>12/</u>      |
| Lime Modified Soil  | 310.15          | 1500 ft. (1 per 450m)               | F.B., IDR       | <u>12/</u>      |
| Thermoplastic Pvt. Mkg.   | 780.13          | Once per size, per color            | F.B., IDR       | <u>1/</u>       |
| Pay Items where a specific thickness is required and the Method of measurement is not by volume or weight |                 |                                     | F.B., IDR       |                 |

Note: Thickness check shall include the entire typical cross section at the locations designated.

- \* Cores required: In addition to making field thickness measurements, the District may cut cores and make independent measurements. The core results will be the basis for adjustment in unit prices for deficient pavement.
- 1/ Thickness determinations shall be documented by before and after cross sections or before and after measurements from an established reference elevation such as a stringline, form line or edge of pavement.
- 2/ Thickness determinations will be made during (in the plastic state) and after placement of the material and recorded at the frequency shown in this table. Thin base course, as determined by core measurements, will require an adjustment in the contract unit price as per Art. 420.15.
- 3/ Thickness determinations will be made during and after placement of the material and recorded at the frequency shown in this table. Thin base course, as determined by core measurements, will require an adjustment in the contract unit price as per Art. 420.15.

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- 4/ Thickness determinations shall be made during (in the plastic state) and after placement of the material and recorded at the frequency shown in this table. Thin pavement, as determined by core measurements, will require an adjustment in the contract unit price as per Art. 420.15.
- 5/ Subgrade shall be checked after trimming from an established reference elevation such as stringline. All thickness checks shall be recorded at the frequency shown in this table. Thin pavement, as determined by core measurements, will require an adjustment in the contract unit price as per Art. 407.10.
- 6/ Thickness shall be determined by measurements from the existing edge of pavement or form line.
- 7/ Thickness determinations shall be made during (in the plastic state) and after placement of the material and recorded at the frequency shown in this table. Shoulder areas less than 90% of the plan nominal thickness shall be removed and replaced in accordance with Art. 483.07.
- 8/ Thickness determinations shall be made during and after placement of the material and recorded at the frequency shown in this table. Shoulder areas less than 90% of the plan nominal thickness shall be brought to the proper thickness by placing additional shoulder material or by complete removal and replacement of the deficient shoulder area. However, the final shoulder elevation shall not exceed the plan elevation or elevation established by the Engineer by more than  $\frac{1}{8}$  in. (3 mm).
- 9/ Thickness determinations shall be made during and after placement of the material and recorded at the frequency shown in this table. Subbase areas less than 90% of the plan nominal thickness shall be brought to the nominal thickness by increasing the thickness of the PCC pavement or by removal and replacement with new mixture. When continuously reinforced concrete pavement is to be constructed, correction shall be removal and replacement only. However, the surface elevation of the completed subbase shall not exceed the surface elevation of the completed subbase shall not exceed the surface elevation shown on the plans or established by the Engineer by more than  $\frac{3}{16}$  in (5 mm).
- 10/ Thickness determinations shall be made during and after placement of the material and recorded at the frequency shown in this table. Subbase areas less than 90% of the plan nominal thickness shall be brought to the nominal thickness by increasing the thickness of the PCC pavement, by placing additional bituminous aggregate mixture or by removal and replacement with new mixture. When continuously reinforced concrete pavement is to be constructed, correction shall be removal and replacement only. However, the surface elevation of the completed subbase shall not exceed the surface elevation shown on the plans or established by the Engineer by more than  $\frac{3}{16}$  in (5 mm).
- 11/ Thickness may be determined at the edge of pavement, back of curb, slipform template, or any other location at which the thickness of the item can be verified.
- 12/ Thickness determinations shall be documented by before and after cross sections or before and after measurements from an established reference elevation such as a stringline, form line or edge of pavement or by measuring the depth in a hole dug in the completed work, or when IBV's are conducted indicating the depth of acceptable subgrade improvement.
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## CROSS-SLOPE DETERMINATION REQUIREMENT FOR SIDEWALKS

(Example page F-36) In order to verify compliance with Americans with Disabilities Act (ADA) requirements, cross-slope checks on sidewalks are of utmost importance. Although it must be understood that it is essential to *verify* grade and slope measurements on all sidewalk and other pedestrian circulation paths, the following represents the minimum frequency required for *recording* cross-slope measurements. Similar to the *Thickness Determination Schedule*, **blanket statements such as “All sidewalk cross-slopes measured less than 2 percent” are not acceptable. Actual measurements must be recorded.** It should be pointed out that minimum checking as stated herein may not be sufficient to verify plan slopes. The frequency of checking and documenting cross-slopes should be increased as conditions dictate, and each district may require more stringent documentation requirements than represented here. Slope deficiencies identified by the Resident during construction should immediately be brought to the attention of the Contractor and corrective actions taken. The location of where the cross-slope determinations were taken, along with the results, should be clearly noted on the source document, or cross-referenced to another document. Sidewalks shall have cross-slope determinations documented every 1000 sf, the same as the current thickness determination requirement frequency for sidewalk.

## DOCUMENTATION PROCEDURES FOR CONSTRUCTION ENGINEERING PERFORMED BY CONSULTANTS

Refer to Construction Memorandum 61 for detailed procedures regarding Consultant Construction Engineering Services.

## REGULATED SUBSTANCES MONITORING

The ‘*Removal and Disposal of Regulated Substances (BDE)*’ special provision, under 669.11, Basis of Payment, states ‘Regulated substances monitoring, including completion of form BDE 2732 for each day of work, will be paid for at the contract unit price per calendar day, or fraction thereof to the nearest 0.5 calendar day, for REGULATED SUBSTANCES MONITORING.’

For documentation purposes, the guideline is as follows: If monitoring activities occur for 4 or more hours on a given calendar day, pay 1.0 CALENDAR DAY. If monitoring activities occur for less than 4 hours, pay 0.5 CALENDAR DAY. In no case should there be more than 1.0 calendar day paid on a given calendar day. In all cases, payment is also based on the receipt of Form BDE 2732, ‘Regulated Substances Monitoring Daily Record’.

## DOCUMENTATION OF PAY QUANTITIES BASED ON WEIGHT TICKETS

Pay quantities established based on truck weight tickets are not directly measured by Department representatives. For this reason, the following steps are taken to ensure that the quantities shown on the weight ticket are accurate:

1. The total weight of a truck cannot be obtained by adding separate axle weightings (see Obtaining Tare and Gross Weights of Trucks below).
2. The scale must be checked by the Department of Agriculture (DOA). In accordance with the DOA's Bureau of Weights and Measures Inspection Program, permanent scales are to be checked during each period of 12 months, which means that the scale is inspected at some time within each calendar year. Temporary scales are to be checked at each setup. A check by a DOA-approved commercial scale company will be acceptable if the DOA is unable to provide a current inspection. The date on the decal, identification number on the decal and location of the scale shall be recorded in the Quantity Book. **No payment is to be made for items measured on an unapproved scale.**
3. A State representative should be at the scale to witness the weighing and initial the tickets. This requirement may be waived under certain conditions (see Daily Tare Weights, Automatic Ticket Printers, Weekly Independent Weight Checks, and Small Quantities).
4. Every effort should be made to personally collect and initial all delivery tickets for tonnage pay items, however, the inspector is only to initial those tickets that he/she personally collects. A memorandum should be written to the contract file explaining why the inspector was not present in the witnessing the delivery of the material. A daily yield check should be conducted to justify the total amount placed.

For certain materials, a correction factor is to be applied to the pay quantity shown on the tickets (see Aggregate Moisture Correction and Agricultural Ground Limestone Correction).

### Obtaining Tare and Gross Weights of Trucks

All materials, which are paid for on the basis of truck weights, shall be weighed in accordance with the following procedure. Reference for this procedure is the Illinois Weights and Measures Act, which refers to the National Bureau of Standards Handbook 44.

"A vehicle or a coupled vehicle combination shall be commercially weighted on a vehicle scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination. However:

- (a) the weight of a coupled combination may be determined by uncoupling the various elements (tractor, semitrailer, trailer), weighing each unit separately as a single draft, and adding together the results, or
- (b) the weight of a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform."

### Daily Tare Weights

(Example page F-37) To determine the pay weight of material delivered by truck, both gross and tare weights must be measured. Ordinarily, both measurements are to be witnessed by a representative of



the Department. Frequently, however, the contractors or suppliers loading operations make two separate weightings for each truck burdensome. For this reason, the Department permits the tare weights of each truck to be measured a minimum of once each day, and the measured tare weight of each is then to be used for the remainder of the day.

When daily tare weights are used, the inspector is to witness and record the tare weights for each truck used in that day's supply operations. The inspector's record must identify each truck, the tare weight of the truck, and whether the driver was in the truck during the measurement. Form BC 1465, Report of Truck Tare Weights, is available for this use. (See Small Quantities)

### **Weight Checks**

A weight check is a comparison of the net weight of material shown on the delivery ticket to the net weight measured on another scale. The purpose of a weight check is to give some assurance that the amount of material paid for, as shown on the delivery tickets, is the amount of material delivered to the job site.

For HMA tonnage items, contractors determine the shipping weight either by direct weighing or by using the nominal batch weights. The Standard Specifications require that scales used to measure HMA be equipped with automatic printers (Art. 1102.01(a)(7)). For batch plants the specifications also allow the use of the batch weights, instead of direct scale measurement, when surge or storage bins are not used (Art. 406.13(b)). There are three types of weight checks described in the following sections, one for weekly Independent Weight Checks, and two types (which should be alternated) for ticket weights determined from batch weights. All three types require reweighing the net weight of the material on the selected truck. The difference between them is the source of the weight for comparison with the independent scales.

### **QC Checks by Contractor**

On HMA QC/QA contracts, the contractor is also required to perform scale checks and independent weight checks as part of the QC process. Scale checks performed by the contractor are for the purpose of ensuring the accuracy of the scale equipment. The procedures used by the contractor are the same as used by state representatives for performing the three types of weight checks described in the section above, except the contractor may use the approved platform scales at the plant site or a commercial scale approved by the Engineer. The plant scale must not be the scale used for the original measurement, but may be owned or controlled by the contractor or material supplier. QC checks performed by the contractor do not satisfy the requirement for independent weight checks to be performed by Department personnel.

### **Automatic Ticket Printers**

Article 1102.01 (a)(7) defines an automatic ticket printer as follows:

"The automatic printer shall be an integral part of the scale equipment or the scale and printer shall be directly connected in a manner that will prohibit the manual entry of weights except as provided in a, below.

- a. If the platform scale equipment measures gross weight (mass), the printer will record the gross weight (mass) as a minimum. Tare and net weights (masses) shall be shown on weight tickets and may be printed automatically or entered manually.

- b. If scale equipment on a platform scale zeros out the truck tare automatically, the printer shall record the net weight (mass) as a minimum.
- c. If the scale equipment on a surge bin weigh hopper zeros automatically after discharging each batch, the printer shall record the net weight (mass) as a minimum.
- d. If the scale equipment on surge bins automatically shuts down the feed system and weighs the amount in the silo before and after discharge, the printer shall record the net weight (mass) as a minimum."

For any weights recorded by an automatic ticket printer, no inspector will be required to witness the weighing and initial the ticket at the scale location. If tare weights or net weights are not automatically measured, then an inspector must still witness and record the tare weights (see Daily Tare Weights).

#### **Weekly Independent Truck Weight Check/Action Report (Example pages F-38-40)**

A weekly random check must be performed by a State (or Local Agency and QC) representative to verify the actual weight of material delivered. Independent weight checks are to be performed as follows:

- 1) The check weights will be measured on an independent, approved platform scale other than the scale on which the original measurement is performed and not owned or controlled by the contractor or material supplier. The independent scale must be approved, and the DOA decal information is to be recorded on the BIC 2367.
- 2) Trucks are to be selected after leaving the plant, preferably at the paving location. Inspections should be unannounced and randomly scheduled. Under no circumstances should the inspector report to the plant and request a truck be loaded for an independent weight check.
- 3) Gross and tare weights must be measured and recorded, so that the actual net weight of material can be determined. Ensure the independent scale has been zeroed prior to determining both the gross and tare weights.
- 4) The independently measured net weight must agree with the weight shown on the tickets within a tolerance of 0.50 percent (HMA) 0.70 percent (aggregate):

$$\text{Tolerance (\%)} = (\text{delivery ticket net wt} - \text{weight check net wt}) \times 100 / (\text{weight check net wt})$$

- 5) The RE and the contractor shall be provided a copy of the BIC 2367. The information shall also be reported to the District Office which will in turn inform any other RE being supplied from the same producer. The independent weight check results are to be recorded and placed in the job file available for inspection, with corrective action taken for deviations from tolerance noted.
- 6) If the independent weight check results are not within tolerance, at the contractor's request, the empty vehicle may be re-weighed on a second independent approved scale. The three empty weights will be analyzed to determine the validity of the independent weight check.
- 7) Independent weight checks must be performed at least once per week per scale (this includes any scale and batch weights) when any item is placed for which payment is based on weight tickets. If the same scale is used for several contracts during the week, a weight check performed for any one of the contracts will be sufficient for all of the contracts, as long as a copy of the check is included in the records for each of the projects. (See Small Quantities)

- 8) The contractor must respond to the Engineer, in writing, within 7 calendar days as to the cause and correction of the deficient scale.

Note:

- a) The DOA performs maintenance checks of scales that have current decals. If the scale is out of tolerance a red tag is used and the scale is not usable. The scale cannot be used during the time it has a red tag.
- b) The Bureau of Investigations and Compliance (BIC) is conducting random independent weight checks utilizing statewide independent scales. When an independent weight check is performed by BIC, the Resident can utilize the weight check to satisfy the weekly independent weight check requirement outlined above.

(See Article 109.01 for additional instructions)

### **Documentation for Payment of Hot-Mix Asphalt Based on Batch Weights**

The Specifications provide for measurement of the mixtures by either weighing the mixtures on approved platform scales or on the basis of plant batch weights. When measured on the basis of plant batch weights, occasional checks shall be made by weighing full truckloads of the mixture on the approved platform scale at the plant site, or on a commercial scale approved by the Engineer. This check serves two purposes:

- (a) To check the accuracy of the scales, either batch, surge bin or the platform scales; or
- (b) The accuracy of batching the mixture

The frequency of check weighing should be a minimum of one per week; however, when the plant is in continuous daily operation, the frequency preferably should be one per day.

The accuracy of the scales should be checked by observing the actual scale weight of the batches produced and comparing the total with the net weight of a truck load from the platform scale. Variations between these weights of more than 0.5 percent would indicate the batch scales or the platform scales should be checked by the Illinois Department of Agriculture.

#### Scale Accuracy Check (0.5% Tolerance)

|   |                |
|---|----------------|
| 1. Tare a truck on an approved platform scale   | 15000lbs       |
| 2. As you observe the scale dial stopping on    | 3,979.0        |
| or near the preset scale face marker,           | 3,951.0        |
| record the <u>actual</u> accumulative aggregate | 4,149.0        |
| weight. Add in the mineral filler and paving    | 3,960.0        |
| asphalt weights.                                | <u>4,101.0</u> |
|   | 24,289 lbs.    |

3. Gross the truck on the platform scale. 39,401 lbs.

$$\begin{aligned}\text{Tolerance, } 0.5\% &= \frac{\text{net wt.}(3-1) - \text{summation of weighed batches}}{\text{net wt.}(3-1)} \times 100 \\ &= \frac{24,401 - 24,289}{24,401} \times 100 \\ &= 0.46\% \text{ O.K.}\end{aligned}$$

The accuracy of batching the mixture should be randomly checked with the batch weights compared to the platform scales. The results, with an allowance for accuracy in weighing, should be checked within 0.5 percent of the gross load on the platform scale. If batch weights vary more than 0.5 percent, the batch scales should be recalibrated.

Batching Accuracy Check (0.5% Tolerance)

1. On an approved platform scale weigh a random truck after it has been loaded. 37,840.0 lbs.
2. Empty it on the job.
3. Tare the returning truck on the platform scale. 14,191.0 lbs.
- Actual net weight = 23,649.0 lbs.
4. Record the load ticket 24,000.0 lbs.

$$\begin{aligned}\text{Tolerance, } 0.5\% &= \frac{\text{load ticket (4)} - \text{actual net weight (1-3)}}{\text{actual net weight}} \times 100 \\ &= \frac{24,000 - 23,649}{23,649} \times 100 = 1.48\% \text{ Re check and/or recalibrate}\end{aligned}$$

The Specifications also require the batch scales to be calibrated at the beginning of each construction season and at other times as deemed necessary by the Engineer. The accuracy certification will be by the Department of Agriculture.

The calibration and check weighing results are to be recorded and placed in the job file available for inspection with corrective action taken for deviations from tolerance noted.

Each of the above checks can be run on alternate occasions. Report these accuracy checks on Form MI 305, Bituminous Daily Plant Output, Independent Weight Check Form BIC 2367, or other methods using the above format. Results shall be placed in the job file.

**Aggregate Moisture Correction (Example page, F-41)**

To correct the scale weight of Type A aggregate items, where a moisture deduction is applicable (see Art. 311.08(b)), the following formulas shall be used.

$$(a) \text{ actual moisture} = \frac{(\text{wet weight of sample}) - (\text{dry weight of sample})}{(\text{dry weight of sample})}$$

$$(b) \text{ pay weight} = \frac{(\text{scale weight}) \times (1 + \text{allowable moisture})}{(1 + \text{actual moisture})}$$

Note: Actual moisture content test results shall be rounded to the nearest 0.1% in accordance with the Manual of Test Procedures for Materials.

### **Agricultural Ground Limestone Correction**

(Example page F-42) In accordance with Article 250.09, the pay weight for this item is to be adjusted using a source correction factor for the source of the agricultural limestone. This correction factor is stored in the MISTIC system, and is available upon request from the district Materials Engineer.

The adjusted pay weight is to be calculated as follows:

Adj. pay weight = (ticket weight) / (4 year source correction factor)

### **Small Quantities**

Witnessing the weighing and initialing of weight tickets at the scale site for materials paid on the basis of weight tickets should have a high priority. However, due to logistics between sources and jobsites, small quantities may be accepted providing the receiving inspector is satisfied that prior to accepting the material the weight appears satisfactory. Under these conditions, the Resident is permitted to waive the following inspection requirements for items whose pay quantity is determined by scale measurements.

1. No inspector will be required to be present at the scale to witness the weighing and initial the tickets.
2. No inspector will be required to witness and record tare weights for that day (if otherwise applicable).
3. No independent weight checks (if otherwise applicable) will be required as a result of that day's delivery of material.
4. No moisture determination will be required (if otherwise applicable) for that day.

Limits on accepting the Contractor's or Supplier's weight tickets in accordance with this section are as follows:

- Aggregate – Not to exceed 500 tons (500 m ton) per day
- Hot-Mix Asphalt – Mixtures for roadways should not exceed 250 tons (250 m ton) per day.
- Bituminous materials – Not to exceed 4000 lbs (1800 kg) per day.
- Other materials consistent with this section.

Unlimited quantities for the following items:

- Fertilizer Nutrients
- Calcium Chloride
- Hydrated lime for lime stabilized soil
- Agriculture ground limestone

**Individual Load Ticket Waiver For Recycled Aggregates Paid On Square Yard or Cubic Yard Basis**

When recycled PCC or bituminous concrete is allowed for use in lieu of virgin aggregate for a square yard or cubic yard pay item (i.e. Agg. Subgrade 12) and the material is crushed/milled, graded and properly tested, the requirement for individual load tickets can be waived. Instead, the contractor can provide a daily tabulation of each truck used to provide this material. This tabulation will contain, at a minimum, the truck number, struck capacity (volume calculation), number of loads delivered for each vehicle and the total calculated volume for the day. Eighty percent of this calculated volume can then be used for yield check determinations.

Progress documentation quantities should also use 80% of the daily volume determined above for estimating cubic yard items. Station to station length times the average width calculations can be used for estimating square yard items. Depth check measurements and documentation are still required. Final documentation of the quantity will consist of field measurements and calculations or Agreement on Accuracy of Plan Quantities using Form BC 981. Verbal approval by the Bureau of Materials, properly documented in the Resident's diary and quantity book, is evidence of material inspection for progress payments. Final Evidence of Material Inspection should be noted in the quantity book as "Material and gradation approved by Bureau of Materials". Copies of the gradation testing data must be in the Resident's final job records.

**FINAL DOCUMENTATION**

The final quantity for all items appearing in the Quantity Book must be cross-referenced to one of the following which will serve as documentation and which will show measurements and calculations used in determining the final quantity.

Note: Calendar Month, Calendar Day, Each and Lump Sum items entered directly into the Quantity Book will not require a cross reference but these items will require a cross-reference if documented on a source document other than the Quantity Book.

- (a) Field measurement books. (hardback only)
- (b) Inspector's Daily Report, BC 628, if identified as a "final field measurement."
- (c) Cross-section paper for cross sections only.
- (d) Weight tickets bound and summarized by means of an adding machine tape or spreadsheet.  
Example page F-41.
- (e) Project diary for calendar month or calendar day items.
- (f) Calculation file for such items as concrete structures and reinforcement bars.
- (g) Agreement on Accuracy of Plan Quantity, BC 981.
- (h) Force account file with Extra Work Daily Report, BC 635, and contractor's invoice.
- (i) Weekly Trainee Report, SBE 1014, file with signed reports for Trainees.
- (j) Built According to Standard #\_\_\_\_.
- (k) Computer printout/spreadsheet.
- (l) Traffic Control Surveillance Report, BC 2240.

The cross-referenced note for final measurements and calculations shall be placed at the bottom of the Quantity Book page, Form BC 625, and should be made only to the document(s) containing the information used in obtaining the final quantity. On items requiring depth checks, the final source of

documentation in the quantity book shall include a reference to the depth check documentation location, if that information is located in a different location (Example page, F-7).

All calculations made to determine final pay quantities must be checked by someone other than the preparer. (See Section D for Recommended Checking Procedures)

All documents in the project files must be identified with the project designation (contract number or job stamp), except that documents identified above (Quantity Book, project diary and field books) and any document circulated outside the field office must contain the complete project designation (job stamp).

In addition, if an individual document includes more than one (loose leaf) page, then each page should indicate that it belongs to the same document. This could be indicated, for example, by noting such information as the date, IDR number or "page \_\_\_ of \_\_\_."







## **Section B**

FINAL DOCUMENTATION  
REQUIREMENTS BY PAY UNIT



The following is a general breakdown of most pay units showing the degree of accuracy for measuring each and information required for documenting each. It is acceptable to leave final quantities to the same accuracy as the daily quantities.

| PAY UNIT   | ACCURACY OF MEASUREMENT   | REQUIRED DOCUMENTATION   |
|--|---|--|
| <b>Acre</b><br>(Hectare)<br><i>Seeding</i><br><i>page F-43</i><br><br><i>Tree Removal</i><br><i>(acres) refer to</i><br><i>Art. 201.10(b)(2)</i>   | 1. Summation of final quantity to nearest 0.1 acre (0.1 hectare).   | 1. Field measurements used to calculate the final quantity<br><br>$\text{Area (acre)} = \frac{L \text{ (ft)} \times W \text{ (ft)}}{43,560}$ $\text{Area (ha)} = \frac{L \text{ (m)} \times W \text{ (m)}}{10,000}, \text{ or}$<br>2. Form <a href="#">BC 981</a> (where applicable).  |
| <b>Calendar Day</b><br><i>Traffic Control</i><br><i>Surveillance</i><br><i>page F-44</i>   | 1. Daily or fraction thereof, to the nearest 0.01 CAL DAY.  | 1. Monthly entries in the Quantity Book cross referenced to daily, summarized <a href="#">BC 2240</a> 's, Traffic Control Surveillance Reports, or<br>2. Other source documents.   |
| <b>Calendar Month</b><br><i>Engr. Field Office</i><br><i>page F-2</i>  | 1. Monthly or fraction thereof.<br>2. Summation of final quantity to nearest 0.5 month.   | 1. Project Diary entry, Quantity Book entry, or other source document on the date the office or lab is ready for use, and the date the Contractor was notified the office or lab would no longer be needed, and<br>2. Monthly entries in the Quantity Book.  |
| <b>Cubic Yard</b><br>(Cubic Meter)<br><i>Structure Ex.</i><br><i>page F-45</i><br><br><i>Trench Backfill</i><br><i>page F-46</i><br><br><i>P.G.E. Note on</i><br><i>page F-25</i><br><br><i>Conc. Struct.</i><br><i>Page F-47, 48</i><br><br><i>Conc. Outlet</i><br><i>page F-49</i> | 1. Final quantity of concrete measured to nearest 0.1 cubic yard (0.1 cubic meter)*.<br>2. All other items measured to the nearest 0.1 cubic yard (0.1 cubic meter) daily and the final quantity summarized to the nearest cubic yard (cubic meter)*.<br><br>* Note: Individual dimensions shall be measured at least to the nearest 0.1 ft (0.03m) | 1. Field measurements used to calculate the final quantity or the statement "built to plan dimensions" when they are used to calculate the final quantity, and<br>2. Calculations. Or<br>3. "Built according to Standard ____"; "Built according to plan detail sheet ____" statements. Or<br>4. Form <a href="#">BC 981</a> (where applicable) with calculations for daily estimates<br>5. Depth checks (where applicable). |
| <b>Each / Lump Sum</b><br><i>Surf. Var's. F-50</i><br><i>Traf Cont Price</i><br><i>Adj F-52, 53</i>  | 1. Each   | 1. Recorded by Station or location and date in the Quantity Book<br>2. Calculations required for any adjustments.  |

| PAY UNIT   | ACCURACY OF MEASUREMENT   | REQUIRED DOCUMENTATION  |
|--|---|---|
| <b>Foot</b><br>(Meter)<br><i>Elec. Cables</i><br>page <a href="#">F-54, 55</a><br><br><i>Pipe Culvert</i><br>page <a href="#">F-56</a><br><br><i>Piling</i><br>page <a href="#">F-57-60</a>  | 1. Each run measured to the nearest 0.1 ft. (0.1 m).<br><br>2. (English) Summation of final quantity to the nearest foot. (Metric) Leave final quantity to nearest 0.1 meter. | 1. Field Measurements.<br><br>2. Depth checks (where applicable)  |
| <b>Gallon</b><br>(Liter)<br><br><i>Prime Coat</i> page <a href="#">F-61</a> (on adding machine tape)   | 1. Summation of final quantity to nearest gallon (liter).   | 1. Calculations based upon initialed weight tickets and Specific Gravity per gallon (liter). The Specific Gravity is given on the shipping or storage ticket.<br><br>$\text{Vol (gallon)} = \frac{\text{net wt. (lbs)}}{8.328 \times \text{Sp. Gr.}}$<br><br>$\text{Vol (liter)} = \frac{\text{net wt. (kg)}}{\text{Sp. Gr.}}$<br><br>2. Record of the D.O.A. decal date, I.D. number, and scale location.  |
| <b>Hour</b><br><i>Trainees</i><br>page <a href="#">F-62</a>  | 1. Hourly   | 1. Monthly entries in the Quantity Book cross referenced to summarized, weekly prepared <a href="#">SBE 1014</a> 's.  |
| <b>Pound</b><br>(Kilogram)<br><i>Rebar</i><br>page <a href="#">F-31, 47</a><br><br><i>Str. Steel</i><br>page <a href="#">F-63</a><br><br><i>Fertilizer</i><br>page <a href="#">F-64</a><br><br><i>Prime (Tack) Coat</i><br>page <a href="#">F-71, 72</a> | 1. Summation of final quantity to nearest pound (kilogram).   | 1. Calculations based on the Bill-of-Materials. Use the weight table shown in Art. 508.10, or<br><br>2. "Built according to Standard ____"; "Built according to plan detail sheet ____" statements, or<br><br>3. Weight tickets or bag counts, accompanied by conversion calculations (Fertilizer Nutrients), or<br><br>4. Form <a href="#">BC 981</a> (where applicable)<br><br>5. For prime (tack) coat paid by the pound, the "Required Documentation" under the <b>Ton</b> Pay Unit shall apply where applicable. |

| PAY UNIT  | ACCURACY OF MEASUREMENT  | REQUIRED DOCUMENTATION   |
|---|--|--|
| <b>Square Foot or Square Yard</b><br>(Square Meter)<br><i>PCC Sidewalk</i><br><i>page F-36</i><br><br><i>Patching</i><br><i>page F-65</i><br><br><i>Base Cse Wid</i><br><i>page F-66</i><br><br><i>Slopedwall</i><br><i>page F-67</i> | 1. Individual areas measured to the nearest 0.1 sq. ft. or 0.1 sq. yd. (0.1 sq. meter) *<br>2. Summation of final quantity to nearest sq. ft. or sq. yd. (square meter).<br><br>* Note: Individual dimensions shall be measured at least to the nearest 0.1 ft (0.03m) | 1. Field measurements and calculations used to calculate the final quantity or the statement, "built according to plan detail sheet ____", or<br>2. Form <a href="#">BC 981</a> (where applicable), and<br>3. Depth checks (if applicable).<br>4. For sidewalk, cross-slope verification in order to comply with ADA requirements.   |
| <b>Ton</b><br>(Metric Ton)<br><i>Aggr Gr Limestone</i><br><i>page F-42</i><br><br><i>Aggr Base Cse</i><br><i>page F-41</i><br><br><a href="#">HMA SC</a><br><a href="#">Page F-34, 17, 18</a>   | 1. Nearest 0.1 tons daily.<br>2. Summation of final quantity to nearest ton except for bituminous materials, tack, or prime coat; where the final quantity shall be to the nearest 0.1 tons.   | 1. Weight tickets showing the material, date and weight, and<br>2. Daily adding machine tape showing: job designation, pay item number & description, date, location, net weight & pay weight corrected for moisture and/or 4-year lime conversion factor, if required, with "Calc. By:" and "Checked By:" initials and dates, and<br>3. Record of the <a href="#">Department of Agriculture</a> decal date and identification number in the Quantity Book or a record of a DOA-approved commercial scale company, and<br>4. Independent Truck Weight Check (not needed for Small Quantities), and<br>5. Scale check for HMA batch plants or when automatic printer tickets are used in lieu of scale inspector, and<br>6. Tickets should have the jobsite inspector's initials on them, and<br>7. Tickets should have the scale inspector's initials (where applicable), and<br>8. Daily tare weights on each truck recorded and retained (where applicable). |

| PAY UNIT   | ACCURACY OF MEASUREMENT  | REQUIRED DOCUMENTATION   |
|--|--|--|
| <b>Unit</b><br>1000 gal.<br>(1000 liters or<br>5000 liters)<br><br>Suppl. Water<br>page F-68 | 1. Nearest 0.1 daily.<br><br>2. Summation of final quantity to nearest unit.   | 1. Meter tickets or<br><br>2. Weight tickets and calculations<br><br>$\text{Vol (gallon)} = \frac{\text{net wt. (lbs)}}{8.328 \times \text{Sp. Gr.}}$<br><br>$\text{Vol (liter)} = \frac{\text{net wt. (kg)}}{\text{Sp. Gr.}}$<br><br>(Sp. Gr. for water = 1.0)<br><br>or<br><br>3. Volume measurements of conveyance and calculations or<br><br>4. Record manufacturer rated capacity of truck tank when full loads are used.                             |
| <b>Unit</b><br>100 ft.(30 m)   | 1. Nearest 0.1 daily.<br><br>2. Summation of final quantity to nearest unit.   | 1. Field measurements. Measure each side separately for Excavating and Grading Existing Shoulders.<br><br>2. Record by Station (left or right) or location.<br><br>3. Calculations.  |
| <b>Unit</b><br>100 plants or 100 seedlings<br>Seedlings<br>page F-69                         | 1. Perennial plants to the nearest 0.05 daily;<br><br>Seedlings to the nearest 0.1 daily.<br><br>2. Summation of final quantity to nearest unit. | 1. Record by Station (left or right) or location.<br><br>2. Calculations.  |
| <b>Unit Diameter</b><br>Tree Removal<br>page F-70  | 1. Summation of final quantity to nearest unit diameter.   | 1. If a tree tape was used, make a note of this with your field measurements. If a tree tape was not used, the actual field measurements must be shown along with calculations for the appropriate Unit Diameter.<br><br>Unit Dia. = $\frac{\text{circumference (in.)}}{\Pi}$<br>(English)<br><br>Unit Dia. = $\frac{\text{circumference (mm)}}{25 \Pi}$<br>(metric)<br><br>(Note: Art. 201.10 defines $\Pi = 3.1416$ )<br><br>and<br><br>2. Calculations. |

# **Section C**

**(Updated to 2024 Project Procedures Guide, Attachment 3)**

**FINAL DOCUMENTATION REQUIREMENTS BY PAY ITEM**





For payment of work, two key pieces of information are needed: 1) Documentation of the quantity of work performed and 2) Evidence of material inspection. This section provides a synopsis of the type of records, measurements and calculations needed to document the work performed and required evidence of materials inspection needed to insure the materials provided meet contract requirements. Evidence of Materials Inspection categories and abbreviations are listed below.

- **BBS 59 (BB59)** – This Department form is a report of acceptance of fabrication of structural steel. The Bureau of Bridges and Structures usually performs this type of inspection and testing.
- **BILL OF LADING (BOL)** – A shipping ticket that accompanies a product to the job site and which identifies the product, source, and lot.
- **CBM (CBM)** – Bureau of Materials approval letter specific to a batch/lot/heat, etc. for a specific contract or producer/supplier.
- **CERTIFICATION (CERT)** – Manufacturer's written certification that indicates material complies with the specifications or contract. Supplier certifications are not acceptable.
- **DAILY PLANT REPORTS (DPR)** – For HMA, reports generated that provide mixture test results and other production data. For non-QMP projects, Daily Plant Reports are the responsibility of the Inspector. For QMP projects, refer to the appropriate special provisions to determine responsibility for Daily Plant Reports. For example, for QC/QA for PCC, the Daily Plant Report is often only the form BMPR MI504 completed by the Producer, Contractor, etc. for aggregate gradations.
- **ILL OK STAMP (ILOK)** – Material is stamped by an IDOT Inspector with an "ILL OK" stamp indicating prior inspection and acceptance. An inspection tag may be used as Evidence of Materials Inspection and approval. A Resident Engineer must make note of the stamp or collect the inspection tag to ensure proper documentation of material inspection.
- **LA-15 (LA15)** – This **Department** form is a supplier's certification indicating material is from approved stock. The form is sometimes used as a Bill of Lading to indicate prior approval. The form should include supplier, proper contract/job designation, material description, manufacturer, specific approved material (test ID number, lots, or batches), and quantity. Additional information on LA-15's is provided in Attachment 1.
- **MARK (MARK)** – A commercial label, tag, or other marking which indicates product specification compliance and/or an approved source/manufacturer. A Resident Engineer must make note of the label, tag, or other marking to ensure proper documentation of material inspection.
- **NONE** – No evidence of material inspection is required. Typical of where work item requires material to be removed from the project or material is naturally in place on the project prior to the contract.
- **QUALIFIED PRODUCT/PRODUCER LIST (LIST)** – The material appears on a current list of Department-approved products or approved sources found at the Department's web site, IDOT Website, under "Doing Business/Material Approvals." Contact the inspecting district's Materials Office for information on aggregates.
- **TEST (TEST)** - Approved test result available via the **MISTIC** system or from locally performed lab or field tests (e.g., soil density).
- **TICKET (TICK)** - A ticket from an approved source indicating **Department** material or aggregate gradation, job designation, purchaser, and weight (if applicable).
- **VISUAL ACCEPTANCE (VIS)** – A RE memo denoting visual inspection is required in the project file, and input into MISTIC is required. A Resident Engineer must make note of the visual acceptance to ensure proper documentation of material inspection.
- **VISUAL EXAMINATION (VISE)** – Same as VIS, but no RE memo or input into MISTIC is required. A Resident Engineer must make note of the visual examination to ensure proper documentation of material inspection.



| SECTION | CODE NO.<br>& ITEM                   | PAY<br>UNIT   | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION |
|---------|--------------------------------------|---------------|--|-----------------|------------------------------------|
| 201     | Tree Removal<br>Tree Removal Special | Unit          | 1. Field measurements.<br>2. Sta. to Sta. groupings listing individual measurements.<br>3. Tree tape or computations.<br>If a tree tape is used, it must be indicated. |                 | None                               |
| 201     | Tree Removal                         | Acre<br>HA    | 1. Form BC 981 or<br>2. Calculations based on the horizontal area within the limits specified on the plans or by the Engineer.   |                 | None                               |
| 201     | Temporary Fence                      | Foot<br>Meter |  |                 | WISE                               |
| 201     | Fertilizer Nutrients                 | LB<br>Kg      | See requirements for these items listed under Section 252 and additional information on page C-5 of this section.  |                 | CERT (bulk) or MARK (bags)         |
| 201     | Supplemental Watering                | Unit          | See requirements for this item listed under Section 252.   |                 | Potable source                     |
| 202     | Earth Excavation                     | CY<br>Cu M    | 1. Form BC 981 or<br>Before & after cross-sections & calcs.  | 39              | None                               |

| SECTION | CODE NO.<br>& ITEM         | PAY<br>UNIT | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION   |
|---------|----------------------------|-------------|--|-----------------|--|
| 202     | Rock Excavation            | CY<br>Cu M  | 1. Before & after cross-sections & calcs or<br><br>2. When the unit prices of Rock Excavation & Earth Excavation are identical, authorized approval can be obtained for a Plan Quantity Agreement for both, Form BC 981. | 39              | None   |
| 202     | Earth Excavation Widening  | CY<br>Cu M  | 1. Before & after in-place measurements & calcs<br><br>Width & depth not to exceed plan dimensions.  | 39              | None   |
| 203     | Channel Excavation         | CY<br>Cu M  | 1. Form BC 981 or<br><br>2. Before & after cross-sections & calcs.   | 39              | None   |
| 203     | Rock Excavation in Channel | CY<br>Cu M  | 1. Form BC 981 or<br><br>2. Before & after cross-sections & calcs.   |                 | None   |
| 204     | Borrow Excavation          | CY<br>Cu M  | 1. Before & after cross-sections & calcs.  | 39              | Soil from outside ROW: Letter of approval from District Materials Engineer |
| 204     | Furnished Excavation       | CY<br>Cu M  | 1. Furn. Exc. = [Emb - Suitable Exc. (1 - SF)], where SF = 0.25 shrinkage factor unless otherwise shown in the plans<br><br>2. See Section 200 of Const. Manual  | 39              | Soil from outside ROW: Letter of approval from District Materials Engineer |

| SECTION | CODE NO.<br>& ITEM          | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                     |
|---------|-----------------------------|--------------|--|-----------------|--|
| 206     | Granular Embankment Special | Ton<br>M Ton | 1. Wt. tickets with moisture correction.<br>2. 108% maximum pay.<br>3. Department of Agriculture scale decal information.  |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 206     | Granular Embankment Special | CY<br>Cu M   | 1. Form BC 981 or<br>2. Before & after in-place measurements & calcs.<br>Width and depth not to exceed plan dimensions.  |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 207     | Porous Granular Embankment  | Ton<br>M Ton | 1. Wt. tickets with moisture correction.<br>2. 108% maximum pay.<br>3. Department of Agriculture scale decal information.  | 39              | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 207     | Porous Granular Embankment  | CY<br>Cu M   | 1. Before & after cross-sections & calcs.  | 39              | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 208     | Trench Backfill             | CY<br>Cu M   | 1. Form BC 981 or<br>2. Trench measurements & calcs.<br>Dimensions used in calcs shall not exceed maximum allowable. See Art. 550.04 of the Std. Specs for maximum trench width, or<br>3. Trench measurements & calcs using the Standard Tables. (for concrete pipe, only) |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |

| SECTION | CODE NO.<br>& ITEM                           | PAY<br>UNIT   | REQUIRED<br>DOCUMENTATION   | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                         |
|---------|--|---------------|---|-----------------|--|
| 209     | Porous Granular Backfill                     | CY<br>Cu M    | 1. Trench measurements & calcs.<br><br>Dimensions used in calcs shall not exceed maximum allowable. See Art. 550.04 of the Std. Specs for maximum trench width, or<br><br>2. Trench measurements & calcs using the Standard Tables. (for concrete pipe, only) |                 | Approved source & Shipment ticket<br>or<br><br>LIST + TICK |
| 210     | Geotechnical Fabric for Ground Stabilization | SY<br>Sq M    | 1. In-place measurement for calcs. (Do not pay for overlapping fabric)  |                 | CERT or LA15   |
| 211     | Topsoil Furnish & Place                      | SY<br>Sq M    | 1. Form BC 981 or<br><br>2. Surface measurements of all authorized areas, and calculations.   |                 | TEST   |
| 211     | &<br>Compost Furnish & Place                 |               | 3. Depth checks.  |                 | CERT   |
| 213     | Exploration Trench                           | Foot<br>Meter | 1. In-place measurements of the open trench.<br><br>2. Depth checks.  |                 | None   |
| 250     | Seeding<br>&<br>Interseeding                 | Acre<br>HA    | 1. Form BC 981 or<br><br>2. Slope measurements of the surface area seeded and calculations.   |                 | CERT<br>or<br>ILOK<br>or<br>LA15                           |

| SECTION | CODE NO.<br>& ITEM   | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION   | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION |
|---------|--|--------------|---|-----------------|------------------------------------|
| 201     | Nitrogen Fertilizer Nutrient   | LB           | 1. Wt. tickets or bag counts with computations.   |                 | CERT (bulk) or MARK (bags)         |
| 250     | &  | Kg           | LB = Total lbs X % of nutrient  |                 |                                    |
| 252     | Phosphorus Fertilizer Nutrient<br>&<br>Potassium Fertilizer Nutrient |              | The scale & job site inspectors' initials<br>must be on tickets.  |                 |                                    |
|         |  |              | 2. 103% maximum pay.  |                 |                                    |
|         |  |              | 3. DOA scale info (if weight tickets used)  |                 |                                    |
| 250     | Agricultural Ground Limestone  | Ton          | 1. Weight tickets   |                 | Approved source & Shipment ticket  |
| 252     |  | M Ton        | 2. Calculations showing that the pay quantity<br>has been corrected using the 4-year source<br>correction factor. |                 | or                                 |
|         |  |              | 3. 108% maximum pay.  |                 | LIST + TICK                        |
|         |  |              | 4. Dept. of Agriculture scale decal information.  |                 |                                    |
| 311     | Subbase Granular Material  | Ton<br>M Ton | 1. Wt. tickets with moisture correction, if<br>required.  |                 | Approved source & Shipment ticket  |
|         |  |              | 2. 108% maximum pay.  |                 | or                                 |
|         |  |              | 3. Dept. of Agriculture scale decal information.  |                 | LIST + TICK                        |
| 311     | Subbase Granular Material  | CY           | 1. Form BC 981 or   |                 | Approved source & Shipment ticket  |
|         |  | Cu M         | 2. In-place surface measurements and calcs.   |                 | or                                 |
|         |  |              | Width and depth not to exceed plan<br>dimensions.   |                 | LIST + TICK                        |

| SECTION | CODE NO.<br>& ITEM        | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                                     |
|---------|---------------------------|--------------|--|-----------------|--|
| 311     | Subbase Granular Material | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.           |                 | Approved source & Shipment ticket<br>or<br><br>LIST + TICK             |
| 312     | Stabilized Subbase        | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.           |                 | HMA: DPR + TICK + TEST<br>CAM II: DPR + TICK + TEST<br>CAM & PSM: TEST |
| 351     | Aggregate Base Course     | Ton<br>M Ton | 1. Weight tickets with moisture correction,<br>if required.<br>2. 108% maximum pay<br>3. Dept. of Agriculture scale decal information. |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK                 |
| 351     | Aggregate Base Course     | CY<br>Cu M   | 1. Form BC 981 or<br>2. In-place measurements and calculations.<br>Width & depth not to exceed plan dimensions.                        |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK                 |
| 351     | Aggregate Base Course     | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.           |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK                 |



| SECTION                  | CODE NO.<br>& ITEM  | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                     |
|--------------------------|---|--------------|--|-----------------|--|
| 352                      | Processing Soil Cement Base<br>Course   | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.                       |                 | TEST   |
| 352                      | Cement  | LB<br>Kg     | 1. Wt. tickets of bag counts and calculations.<br>2. 105% maximum pay.<br>3. Dept. of Agriculture scale decal information.<br>(if wt. ticket used) |                 | (LIST or TEST) + BOL                                   |
| 353<br>354<br>355<br>356 | PCC Base Course<br>&<br>PCC Base Course Widening<br>&<br>HMA Course Widening<br>&<br>HMA Base Course Widening | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.                       |                 | DPR + TICK + TEST                                      |
| 358                      | Preparation of Base   | SY<br>Sq M   | 1. Form BC 981 or<br>2. Measurements of affected areas and calcs.  |                 | None   |
| 358                      | Aggregate Base Repair   | Ton<br>M Ton | 1. Wt. tickets with moisture correction.<br>2. 108% maximum pay.<br>3. Dept. of Agriculture scale decal information.                               |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |

| SECTION | CODE NO.<br>& ITEM   | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                             |
|---------|--|--------------|--|-----------------|--|
| 402     | Aggregate Surface Course   | Ton<br>M Ton | 1. Wt. tickets with moisture correction,<br>if required.<br><br>May be stockpiled ONLY when used for<br>Temporary Access (Art. 402.10)<br><br>2. 108% maximum pay.<br><br>3. Dept. of Agriculture scale decal information.                 |                 | Approved source & Shipment ticket<br><br>or<br><br>LIST + TICK |
| 402     | Aggregate Surface Course   | CY<br>Cu M   | 1. Form BC 981 or<br><br>2. In-place measurements and calculations.<br><br>Width and depth not to exceed plan<br>dimension.  |                 | Approved source & Shipment ticket<br><br>or<br><br>LIST + TICK |
| 402     | Aggregate Surface Course   | SY<br>Sq M   | 1. Form BC 981 or<br><br>2. In-place measurements and calculations.<br><br>Width not to exceed plan dimensions.<br><br>3. Depth checks.  |                 | Approved source & Shipment ticket<br><br>or<br><br>LIST + TICK |
| 403     | Bit Materials (Prime Coat)<br>&<br>Bit Materials (Cover & Seal Coats)<br>&<br>Polymerized (Cover & Seal Coats) | Gal<br>Liter | 1. Weight tickets and calcs or<br><br>2. DOA-approved meter tickets corrected for<br>temp. Not truck distributor meter, unless<br>meter has DOA decal.<br><br>3. 105% maximum pay.<br><br>4. Dept. of Agriculture scale decal information. |                 | (LIST or TEST) + BOL   |
| 403     | Bit Materials (Prime Coat)<br>&<br>Bit Materials (Cover & Seal Coat)   | Ton<br>M Ton | 1. Weight tickets.<br><br>2. 105% maximum pay.<br><br>3. Dept. of Agriculture scale decal information.   |                 | (LIST or TEST) + BOL   |

| SECTION    | CODE NO.<br>& ITEM   | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                     |
|------------|--|--------------|--|-----------------|--|
| 403        | Cover Coat Aggregate<br>&<br>Seal Coat Aggregate   | Ton<br>M Ton | 1. Wt. tickets with moisture correction.<br>2. 110% maximum pay.<br>3. Dept. of Agriculture scale decal information.   |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 406<br>408 | Bit Materials (Prime Coat)<br>Polymerized (Prime Coat)   | Gal<br>Liter | 1. Weight tickets and calculations, or<br>2. DOA-approved meter tickets corrected for<br>temp. Not truck distributor meter.<br>3. 105% maximum pay.<br>4. Dept. of Agriculture scale decal information.  |                 | (LIST or TEST) + BOL                                   |
| 406<br>408 | Bit Materials (Prime Coat)<br>Polymerized (Prime Coat)   | Ton<br>M Ton | 1. Weight tickets<br>2. 105% maximum pay.<br>3. Dept. of Agriculture scale decal information.  |                 | (LIST or TEST) + BOL                                   |
| 406<br>408 | Aggregate Prime Coat   | Ton<br>M Ton | 1. Weight tickets<br>2. Dept. of Agriculture scale decal information.  |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 406        | Mix for Cracks Joints & Flangeways<br>&<br>Leveling Binder Machine Method<br>&<br>Leveling Binder Hand Method<br>&<br>HMA Binder Course<br>&<br>HMA Surface Course Class I or<br>Superpave | Ton<br>M Ton | 1. Weight tickets initialed at jobsite<br>2. Daily weight totals tabulated on<br>calculator tape.<br>3. Platform scale tickets used in weight checks<br>(where applicable).<br>4. Dept. of Agriculture scale decal information.<br>5. 103% maximum pay.<br>6. Smoothness test (for HMA surfaces) |                 | DPR + TICK + TEST                                      |

| SECTION | CODE NO.<br>& ITEM  | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION |
|---------|---|--------------|--|-----------------|------------------------------------|
| 407     | HMA Pavement (Full Depth)   | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs, width not to exceed plan dimensions.<br>3. Depth checks.  |                 | DPR + TICK + TEST                  |
| 408     | Incidental HMA Surfacing  | Ton<br>M Ton | For all plants:<br>1. Weight tickets initialed at jobsite<br>2. Daily weight totals tabulated on calculator tape.<br>3. Platform scale tickets used in weight checks (where applicable).<br>4. Dept. of Agriculture scale decal information.<br>5. 103% maximum pay. |                 | DPR + TICK + TEST                  |
| 420     | PCC Pavement<br>&<br>HE PCC Pavement<br>&<br>PCC Pavement (Jointed)       | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.<br>4. Surface tests (and price adjustment if necessary).  | 39              | DPR + TICK + TEST                  |
| 420     | Bridge Approach Pavement<br>&<br>PCC Bridge Approach Shoulder<br>Pavement | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks.   | 39              | DPR + TICK + TEST                  |

| SECTION | CODE NO.<br>& ITEM                          | PAY<br>UNIT | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION   |
|---------|---|-------------|--|-----------------|--|
| 420     | Bridge Approach Pavement<br>Connector       | SY<br>Sq M  | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks. | 39              | DPR + TICK + TEST  |
| 420     | Welded Wire Reinforcement                   | SY<br>Sq M  | 1. Same as pavement quantity   | 88              | LIST + CERT  |
| 420     | Protective Coat                             | SY<br>Sq M  | 1. Form BC 981 or<br>2. In-place measurements and calculations of<br>the area where Protective Coat is applied.              |                 | LA15 or ILOK or TEST or CBM  |
| 421     | Continuously Reinforced PCC<br>Pavement     | SY<br>Sq M  | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks. |                 | DPR + TICK + TEST  |
| 421     | Pavement Reinforcement                      | SY<br>Sq M  | 1. Same as pavement quantity   | 88              | LIST + CERT + MARK   |
| 421     | Wide Flange Beam Terminal<br>Joint Complete | Each        | 1. Date and Station in Quantity Book.  | 88              | Concrete: DPR + TICK + TEST<br><br>Rebar: LIST + CERT + MARK<br><br>Epoxy Coated Rebar:<br>LIST + CERT + MARK<br><br>Steel beam: BBS 59 + CERT |

| SECTION | CODE NO.<br>& ITEM  | PAY<br>UNIT  | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION                     |
|---------|---|--------------|--|-----------------|--|
| 421     | Protective Coat   | SY<br>Sq M   | 1. Form BC 981 or<br>2. Measurements and calculations of the area<br>where Protective Coat is applied.                       |                 | LA15 or ILOK or TEST or CBM                            |
| 424     | PCC Sidewalk  | SF           | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>3. Depth checks.<br>4. Cross slope checks.               | 86              | DPR + TICK + TEST                                      |
| 481     | Aggregate Shoulders Type A<br>&<br>Aggregate Shoulders Type B | Ton<br>M Ton | 1. Wt. tickets with moisture correction, if<br>required.<br>2. 108% maximum pay.   |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 481     | Aggregate Shoulders Type A<br>&<br>Aggregate Shoulders Type B | CY<br>Cu M   | 1. Form BC 981 or<br>2. In-place measurements and calculations.<br>Width and depth not to exceed plan<br>dimensions.         |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 481     | Aggregate Shoulders Type A<br>&<br>Aggregate Shoulders Type B | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks. |                 | Approved source & Shipment ticket<br>or<br>LIST + TICK |
| 482     | HMA Shoulders   | SY<br>Sq M   | 1. Form BC 981 or<br>2. In-place surface measurements and calcs.<br>Width not to exceed plan dimensions.<br>3. Depth checks. |                 | DPR + TICK + TEST                                      |

| SECTION | CODE NO.<br>& ITEM  | PAY<br>UNIT | REQUIRED<br>DOCUMENTATION   | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION |
|---------|---|-------------|---|-----------------|------------------------------------|
| 501     | Concrete Removal  | CY<br>Cu M  | 1. Field measurements and calculations.   |                 | None                               |
| 502     | Structure Excavation<br>&<br>Cofferdam Excavation<br>&<br>Rock Excavation for Structure | CY<br>Cu M  | 1. Measurements of material in original position and calculations.<br>See Spec. for maximum allowable limits of excavation for payment, or<br>2. For BC 981, except for Rock Excavation for Structure, which must be measured.  |                 | None                               |
| 503     | Class MS Concrete<br>&<br>Concrete Handrail<br>&<br>Concrete Encasement                 | CY<br>Cu M  | 1. Form BC 981 or<br>2. Calculations in permanent file verifying plan, or revised, quantity and<br>3. A statement indicating the structure was built in accordance with plan dimensions or a sketch showing measurement dimensions.<br>4. Price adjustment (per Art. 503.22) if required.   |                 | DPR + TICK + TEST                  |
| 503     | Concrete Structures<br>&<br>Concrete Superstructures                                    | CY<br>Cu M  | 1. Form BC 981 or<br>2. Calculations in permanent file verifying plan, or revised, quantity and<br>3. A statement indicating the structure was built in accordance with plan dimensions or a sketch showing measurement dimensions.<br>4. Deductions for volume of piling, except H pile per Art. 503.21 (b).<br>5. Price adjustment (per Art. 503.22) if required. |                 | DPR + TICK + TEST                  |

| SECTION | CODE NO.<br>& ITEM  | PAY<br>UNIT | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION   |
|---------|---|-------------|--|-----------------|--|
| 503     | Rubbed Finish<br>Form Liner Textured Surface                                    | SF<br>Sq M  | 1. Form BC 981 or<br>2. Measurements and calculations for the<br>areas specified on the plans.   |                 | None   |
| 504     | Precast Concrete Bridge Slab<br>&<br>Precast Prestressed Concrete<br>Deck Beams | SF<br>Sq M  | 1. Form BC 981 or<br>2. Measurements and calculations of<br>horizontal surface area.   |                 | Precast Bridge Slab: LIST + ILOK<br>Precast Bridge Beams: LIST + ILOK<br>Prestressed Bridge Beams: ILOK                    |
| 505     | Furnish & Erect Structural Steel  | LB<br>Kg    | 1. Approved Shop Drawings<br>2. Approved shipping weight tag or platform<br>scale ticket or<br>3. Measurements, and calculations based on<br>standard AISC section weights, deducting<br>for holes, cutouts, etc.<br>4. If authorized changes are made, the<br>calculations for the changes necessary. | 87              | Steel: Fabrication Inspector's<br>Release (BBS 59) + CERT<br><br>High-strength steel bolts:<br>CBM or LA15 or ILOK or TEST |
| 508     | Reinforcement Bars  | LB<br>Kg    | 1. Form BC 981 or<br>2. Calculations in permanent file verifying plan,<br>or revised, quantity. Use the table given in<br>Article 508.10.  | 88              | Rebar: LIST + CERT + MARK<br><br>Epoxy Coated Rebar:<br>LIST + CERT + MARK   |



| SECTION | CODE NO.<br>& ITEM  | PAY<br>UNIT   | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION   |
|---------|---|---------------|--|-----------------|--|
| 509     | Steel Railing<br>&<br>Aluminum Railing<br>&<br>Pedestrian Railing<br>&<br>Bicycle Railing | Foot<br>Meter | 1. Approved Shop Drawings<br>2. Measurements of overall length of top rail.<br>Measure through all posts and gaps.   | 87              | Steel Railing: CBM<br>Aluminum Railing: CERT or LA15<br>Fasteners: CBM or LA15 or ILOK<br>or TEST<br>Post, Anchoring Device:<br>CERT or LA15   |
| 511     | Slope Wall  | SY<br>Sq M    | 1. Form BC 981 or<br>2. Measurements of the surface. The<br>construction of anchor and cut-off walls is<br>incidental to this item.<br>3. Depth checks.  | 88              | Concrete: DPR + TICK + TEST<br>Mesh: LIST + CERT   |
| 512     | Furnishing Piles  | Foot<br>Meter | 1. Itemized list sent to the Contractor by the<br>Engineer authorizing the length of piling<br>to be ordered.<br>2. Piling field notes showing field measurements<br>of the piles.<br>3. Piling Diagram Report BC 2184 |                 | Precast Concrete: LIST + ILOK<br>Prestressed Concrete: ILOK<br>Steel H or Metal Shell: Cert or<br>LA15 or ILOK<br>Timber: CERT or MARK or LA15 |
| 512     | Drive Piles   | Foot<br>Meter | 1. Piling field notes showing field measurements<br>of the piles left in place below the cut-off<br>elevation.<br>2. Piling Diagram Report BC 2184   |                 | None   |

| SECTION | CODE NO.<br>& ITEM                                   | PAY<br>UNIT   | REQUIRED<br>DOCUMENTATION  | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION   |
|---------|--|---------------|--|-----------------|--|
| 542     | Concrete Collar                                      | CY<br>Cu M    | 1. Form BC 981 or<br>2. Statement, "Built according to Standard _____", or<br>3. If a standard collar is not used, computations verifying the plan quantity are required.<br>Rebar should be paid separately in lbs. (kg), as per Art. 542.11. |                 | Cast in Place: DPR + TICK + TEST<br>Precast: LIST + MARK                             |
| 550     | Storm Sewer  | Foot<br>Meter | 1. In-place measurements.<br>See Article 550.09 & 602.12 regarding the method of measurement at drainage structures.   |                 | Concrete: LIST + MARK<br>Plastic: ILOK or LA15 or TEST<br>Clay: ILOK or LA15 or TEST |
| 580     | Membrane Waterproofing                               | SY<br>Sq M    | 1. Form BC 981 or<br>2. Measurements and calculations of the Surface areas covered.  |                 | LA15 or TEST   |
| 606     | Concrete Curb  | Foot<br>Meter | 1. In-place field measurements along the face.<br>See Article 606.14 regarding the method of measurement at drainage structures.<br>2. Depth checks.   | 86              | DPR + TICK + TEST  |
| 606     | Concrete Gutter<br>&<br>Comb. Concrete Curb & Gutter | Foot<br>Meter | 1. In-place field measurements in the flow line.<br>See Article 606.14 regarding the method of measurement at drainage structures.<br>2. Depth checks.   | 86              | DPR + TICK + TEST  |

| SECTION | CODE NO.<br>& ITEM          | PAY<br>UNIT    | REQUIRED<br>DOCUMENTATION   | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION   |
|---------|-----------------------------|----------------|---|-----------------|--|
| 606     | Paved Ditch                 | Foot<br>Meter  | 1. In-place field measurements in the flow line.<br>The construction of anchor and cut-off<br>walls is incidental to this item.<br><br>2. Depth checks.   |                 | DPR + TICK + TEST  |
| 611     | Class SI Concrete Misc.     | CY<br><br>Cu M | 1. Form BC 981 or<br><br>2. Calculations in permanent file verifying<br>plan, or revised, quantity and<br><br>3. A statement indicating the structure was<br>built in accordance with plan dimensions or<br>a sketch showing measured dimensions. |                 | DPR + TICK + TEST  |
| 630     | Steel Plate Beam Guard Rail | Foot<br>Meter  | 1. Measurements of the overall length of the<br>rail element to the limits shown on the plans.<br>End sections are incidental and will NOT<br>be paid for separately.   | 87              | Steel Plate Rail element: LIST + CERT<br><br>Steel Post: CERT or LA15<br><br>Barrier end section: NCHRP 350<br>Pdts. = (LIST + CERT) or LA15<br><br>Non-NCHRP 350 Pdts. - CERT or<br>LA15<br><br>Fasteners: (MARK + CERT) or TEST<br><br>Wood Post: CERT or MARK or LA15 |
| 663     | Calcium Chloride Applied    | Ton<br>M Ton   | 1. Weight tickets.  |                 | Dust Palliative: TEST<br><br>Accelerator: CERT   |

| SECTION | CODE NO.<br>& ITEM  | PAY<br>UNIT   | REQUIRED<br>DOCUMENTATION   | CONST.<br>MEMO. | EVIDENCE OF<br>MATERIAL INSPECTION  |
|---------|---|---------------|---|-----------------|---|
| 664     | Chain Link Fence  | Foot<br>Meter | 1. In-place measurements along fence from center to center of end posts, excluding the length occupied by gates.  |                 | CERT or LA15  |
| 665     | Woven Wire Fence  | Foot<br>Meter | 1. In-place measurements along fence from center to center of end posts, excluding the length occupied by gates.  |                 | CERT or LA15  |
| 780     | Thermoplastic Pavt.<br>Marking Letters & Symbols<br><br>Preformed Plastic Pavement<br>Markings, Letters and Symbols   | SY<br>Sq M    | 1. Calculations based on the size of letter or symbol specified in the contract.<br>See table in Art. 780.12 for letter or symbol areas.<br><br>2. Applied thickness (thermoplastic). |                 | Preformed Plastic Pavement Markings and Thermoplastic Letters/Symbols: CERT or LA15<br><br>Preformed Plastic Pavement Markings and Thermoplastic Tape: LA15 or ILOK or CBM<br><br>Preformed Plastic Pavement Markings and Thermoplastic Component Material: LA15 or ILOK or CBM |
| 780     | Thermoplastic Pavt. Marking Line<br>&<br>Paint Pavement Marking Line<br>&<br>Epoxy Pavement Marking<br>&<br>Preformed Plastic Pavt. Marking Line<br>&<br>Modified Urethane Marking Line<br>&<br>Polyurea Marking Line | Foot<br>Meter | 1. Measurements of each size line applied and accepted.<br><br>2. Applied thickness (epoxy, modified urethane, polyurea, and thermoplastic).  |                 | Thermoplastic Tape: LA15 or ILOK or CBM<br><br>Thermoplastic Component Material: LA15 or ILOK or CBM<br><br>Epoxy, modified urethane, polyurea, thermoplastic, and preformed plastic pavement markings: LA15 or CBM   |



## **Section D**

REFERENCE TABLES



## ESTIMATING DAILY EARTH VOLUMES WITH LOAD COUNTS

Page [A-10](#) of this Documentation Guide presents a concept called "Progress Documentation." Simply stated, it is necessary to provide documented entries in the Quantity Book as work progresses, even though final measurements will usually be provided after the pay item is completed. Therefore, with many pay items, the progress documentation may be based upon nothing more than a recorded estimate of work done.

This section deals with a method of estimating Excavation pay items.

Enclosed is a brief excerpt of hauling volumes of some of the scrapers and hauling units being used in the State. If a piece of equipment is being used and the inspector is estimating earth volumes by load count, have the Contractor provide a specification sheet for the piece(s) of equipment in question. The specification sheet will provide struck capacities. Information can also be obtained from online resources or from the District estimator. Examples are included herein. The following example indicates the procedure that may be used in estimating earth volumes utilizing the struck capacities as shown on available equipment manufacturer's specification sheets or other commercially available resources. Provide a reference to the information on your calculation sheet and store a copy in the job files and/or attach to the daily report.

1. Obtain the daily load count from the contractor. Spot-check occasionally for accuracy.
2. From the specification sheet for the piece of equipment in question, select the struck capacity for the model being used.
3. Multiply the product of the load count and struck capacity by 80%. (This factor may vary somewhat with various materials and loading procedures, but any factor differing from 80% must be documented as to explain the reasoning.)

Example: 70 loads hauled by a CAT 621G.

$$\begin{aligned}\text{The days volume} &= 70 \text{ loads} \times 15.7 \text{ cy} \times 80\% = 879 \text{ cy} \\ &879 \text{ cy} \times 0.764555 \text{ m}^3/\text{cy} = 672 \text{ m}^3\end{aligned}$$


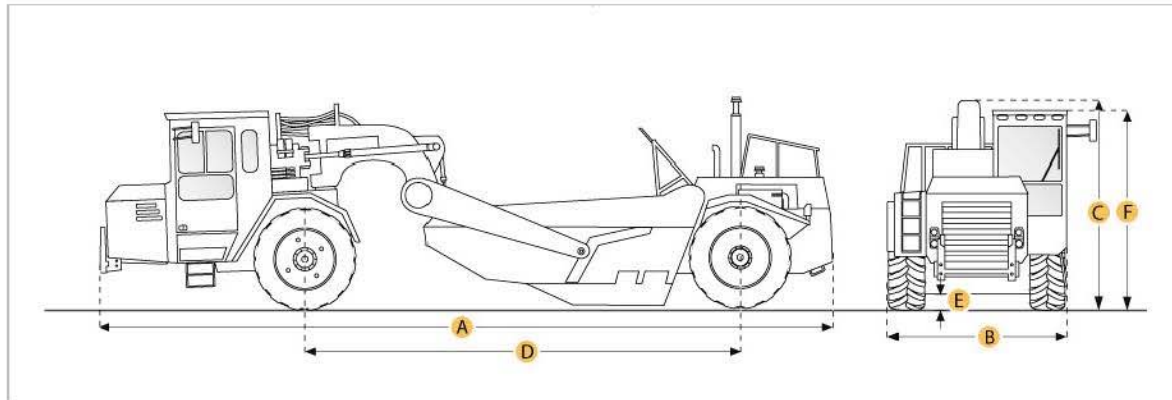
4. The above information and calculations shall be recorded on source documentation, such as the Inspector's Daily Report, Form [BC 628](#), (Example, page [F-24](#)). When subsequent days of excavation take place with the same hauling units, if these are also estimated quantities, the source documents shall reference the first source document on which the struck capacity is shown.

8/7/2018

Caterpillar 621G Motor Scraper

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Current number of specifications

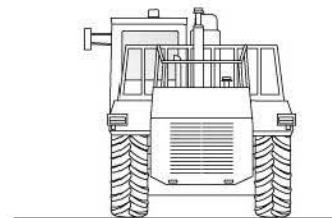
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## Selected Dimensions

| Dimensions                  |            |          |
|-----------------------------|------------|----------|
| A. OVERALL LENGTH           | 42.4 ft in | 12917 mm |
| B. OVERALL WIDTH            | 11.4 ft in | 3467 mm  |
| C. OVERALL HEIGHT           | 12.2 ft in | 3705 mm  |
| D. WHEELBASE                | 25.4 ft in | 7722 mm  |
| E. TRACTOR GROUND CLEARANCE | 1.8 ft in  | 553 mm   |
| F. HEIGHT TO TOP OF CAB     | 11.3 ft in | 3423 mm  |

## Specification

| Tractor Engine                      |  |           |
|-------------------------------------|--|-----------|
| MAKE                                | Caterpillar  |           |
| MODEL                               | C15 ACERT  |           |
| GROSS POWER                         | 393 hp   | 293 kw    |
| NET POWER                           | 365 hp   | 272 kw    |
| DISPLACEMENT                        | 893 cu in  | 14.6 L    |
| Operational                         |  |           |
| FUEL CAPACITY                       | 160 gal  | 606 L     |
| COOLING SYSTEM FLUID CAPACITY       | 28 gal   | 107 L     |
| ENGINE OIL FLUID CAPACITY           | 9.5 gal  | 36 L      |
| TRANSMISSION FLUID CAPACITY         | 19 gal   | 72 L      |
| DIFFERENTIAL FLUID CAPACITY         | 38 gal   | 144 L     |
| HYDRAULIC SYSTEM FLUID CAPACITY     | 37 gal   | 140 L     |
| WHEEL COOLANT FLUID CAPACITY - EACH | 12 gal   | 45 L      |
| OPERATING VOLTAGE                   | 24 V   |           |
| ALTERNATOR SUPPLIED AMPERAGE        | 75 amps  |           |
| TIRE SIZE                           | 33.25-R29  |           |
| Transmission                        |  |           |
| TYPE                                | 8-speed automatic Powershift with Electronic Control |           |
| NUMBER OF FORWARD GEARS             | 8  |           |
| NUMBER OF REVERSE GEARS             | 1  |           |
| MAX SPEED FORWARD                   | 32 mph   | 51.5 km/h |
| MAX SPEED REVERSE                   | 5.7 mph  | 9.2 km/h  |
| Weights                             |  |           |
| TOTAL OPERATING - EMPTY             | 73788.7 lb   | 33470 kg  |


<http://www.ritchiespecs.com/specification?type=con&category=Motor+Scraper&make=Caterpillar&model=621G&modelId=94090>

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Caterpillar 621G Motor Scraper

|                          |             |          |
|--------------------------|-------------|----------|
| FRONT AXLE - EMPTY       | 50177.2 %   |          |
| REAR AXLE - EMPTY        | 23611.5 %   |          |
| TOTAL OPERATING - LOADED | 126589.4 lb | 57420 kg |
| FRONT AXEL - LOADED      | 67093.3 lb  | 30433 kg |
| REAR AXLE - LOADED       | 59496.1 %   |          |

Viewing Photo 1 of 5

|                  |           |          |
|------------------|-----------|----------|
| <b>Bowl</b>      |           |          |
| RATED PAYLOAD    | 52800 lb  | 23950 kg |
| HEAPED CAPACTIY  | 22 yd3    | 17 m3    |
| STRUCK CAPACITY  | 15.7 yd3  | 12 m3    |
| MAX DEPTH OF CUT | 13.1 in   | 333 mm   |
| WIDTH OF CUT     | 9.1 ft in | 3023 mm  |

|                          |            |          |
|--------------------------|------------|----------|
| <b>Dimensions</b>        |            |          |
| OVERALL LENGTH           | 42.4 ft in | 12917 mm |
| OVERALL WIDTH            | 11.4 ft in | 3467 mm  |
| HEIGHT TO TOP OF CAB     | 11.3 ft in | 3423 mm  |
| OVERALL HEIGHT           | 12.2 ft in | 3705 mm  |
| WHEELBASE                | 25.4 ft in | 7722 mm  |
| TRACTOR GROUND CLEARANCE | 1.8 ft in  | 553 mm   |

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 OEM specifications are provided for base units. Actual equipment might vary with options.

8/7/2018

Terex TR45 Rock Truck



Current number of specifications

Home > Spec Search > con > Rock Truck > Terex > TR45

TEREX TR45 ROCK TRUCK

[VIEW ARTICLES ON THIS ITEM](#)

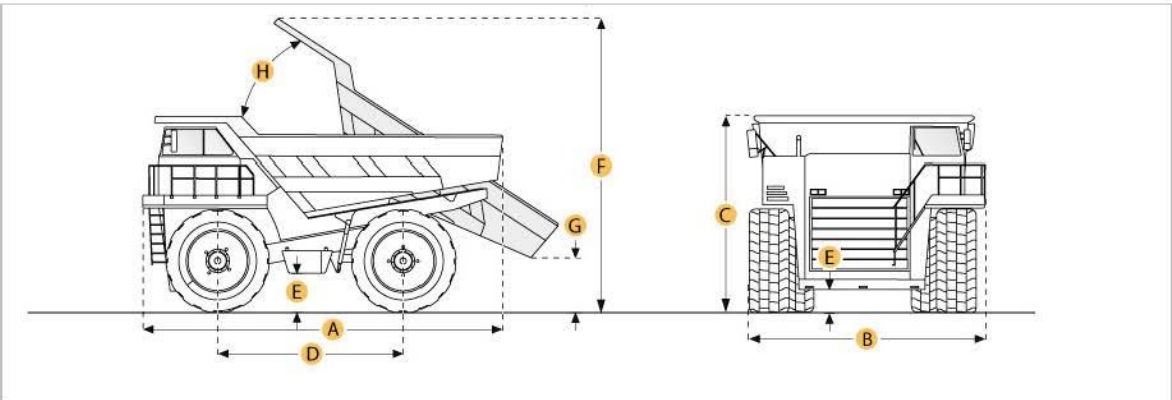
Print specification

Looking to purchase this item?

[Find a Terex TR45 Rock Truck](#) being sold at Ritchie Bros. auctions.

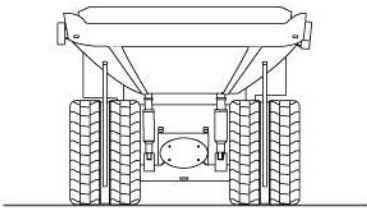
Need to sell equipment?

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Selected Dimensions

| Dimensions               |            |         |
|--------------------------|------------|---------|
| A. OVERALL LENGTH        | 28.5 ft in | 8700 mm |
| B. OVERALL WIDTH         | 15.2 ft in | 4630 mm |
| C. OVERALL HEIGHT        | 13.9 ft in | 4245 mm |
| D. WHEELBASE             | 12.9 ft in | 3940 mm |
| E. GROUND CLEARANCE      | 1.9 ft in  | 585 mm  |
| F. DUMP HEIGHT           | 25.1 ft in | 7645 mm |
| G. DUMP GROUND CLEARANCE | 1.9 ft in  | 585 mm  |
| Dump                     |            |         |
| H. DUMP ANGLE            | 58 degrees |         |



Specification

| Engine                              |                   |           |
|-------------------------------------|-------------------|-----------|
| NUMBER OF CYLINDERS                 | 6                 |           |
| MAKE                                | 2347              |           |
| MODEL                               | QSK19-C525        |           |
| GROSS POWER                         | 525 hp            | 391.5 kw  |
| NET POWER                           | 495 hp            | 369.1 kw  |
| POWER MEASURED @                    | 2100 rpm          |           |
| DISPLACEMENT                        | 1150 cu in        | 18.8 L    |
| MAX TORQUE                          | 1775 lb ft        | 2406.6 Nm |
| TORQUE MEASURED @                   | 1300 rpm          |           |
| ASPIRATION                          | turbocharged      |           |
| Operational                         |                   |           |
| FUEL CAPACITY                       | 160.1 gal         | 606 L     |
| COOLING SYSTEM FLUID CAPACITY       | 38 gal            | 144 L     |
| ENGINE OIL CAPACITY                 | 16.4 gal          | 62 L      |
| DIFF AND FINAL DRIVE FLUID CAPACITY | 15.9 gal          | 60 L      |
| STEERING SYSTEM FLUID CAPACITY      | 22.5 gal          | 85 L      |
| HYDRAULIC SYSTEM FLUID CAPACITY     | 97.2 gal          | 368 L     |
| OPERATING VOLTAGE                   | 24 V              |           |
| ALTERNATOR SUPPLIED AMPERAGE        | 70 amps           |           |
| TIRE SIZE                           | 21.00-35 bias ply |           |
| Transmission                        |                   |           |
| TYPE                                | Allison M5610AR   |           |

8/7/2018

Terex TR45 Rock Truck

|                                    |            |            |
|------------------------------------|------------|------------|
| NUMBER OF GEARS - FORWARD          | 6          |            |
| NUMBER OF GEARS - REVERSE          | 2          |            |
| MAX SPEED                          | 40.4 mph   | 65 km/h    |
| <b>Weights</b>                     |            |            |
| EMPTY WEIGHT                       | 81870 lb   | 37135.6 kg |
| LOADED WEIGHT                      | 171870 lb  | 77958.9 kg |
| WEIGHT DISTRIBUTION FRONT - EMPTY  | 48 %       |            |
| WEIGHT DISTRIBUTION REAR - EMPTY   | 52 %       |            |
| WEIGHT DISTRIBUTION FRONT - LOADED | 34 %       |            |
| WEIGHT DISTRIBUTION REAR - LOADED  | 66 %       |            |
| <b>Dump</b>                        |            |            |
| RATED PAYLOAD                      | 90000 lb   | 40823.3 kg |
| LOAD CAPACITY - STRUCK             | 25.6 yd3   | 19.6 m3    |
| LOAD CAPACITY - HEAPED             | 34 yd3     | 26 m3      |
| DUMP ANGLE                         | 58 degrees |            |
| RAISE TIME                         | 13 sec     |            |
| LOWER TIME                         | 9 sec      |            |
| <b>Dimensions</b>                  |            |            |
| OVERALL LENGTH                     | 28.5 ft in | 8700 mm    |
| OVERALL WIDTH                      | 15.2 ft in | 4630 mm    |
| OVERALL HEIGHT                     | 13.9 ft in | 4245 mm    |
| WHEELBASE                          | 12.9 ft in | 3940 mm    |
| GROUND CLEARANCE                   | 1.9 ft in  | 585 mm     |
| DUMP HEIGHT                        | 25.1 ft in | 7645 mm    |
| DUMP GROUND CLEARANCE              | 1.9 ft in  | 585 mm     |

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When performing a series of arithmetic operations (i.e. addition, subtraction, division, multiplication, exponents), you must perform those operations in a particular order. There is a mnemonic to help you remember the order - PEMDAS:

- P    Parentheses
- E    Exponents
- M    Multiplication
- D    Division
- A    Addition
- S    Subtraction

If you have a series of operations, do what's in parentheses first, then apply exponents, then do any multiplication or division, and finally do any adding or subtracting.

Example:  $4 + 3\left(2 - \frac{1}{4}\right) - 2^3 = ?$

Do what's in parentheses first (find Lowest Common Denominator - LCD):  $2 - \frac{1}{4} = \frac{8}{4} - \frac{1}{4} = \frac{7}{4}$

So now we have  $4 + 3\left(\frac{7}{4}\right) - 2^3 = ?$

Now apply exponents:  $2^3 = 8$

So now we have  $4 + 3\left(\frac{7}{4}\right) - 8 = ?$

Now do multiplication:  $3\left(\frac{7}{4}\right) = \frac{21}{4}$

So now we have  $4 + \frac{21}{4} - 8$

Now do addition and subtraction (find LCD):  $4 + \frac{21}{4} - 8$

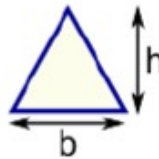
is the same as  $\frac{16}{4} + \frac{21}{4} - \frac{32}{4} = \frac{5}{4}$

So our answer is  $\frac{5}{4}$ .

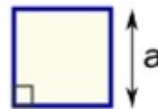
Note: "h" is at right angles (90°) to base "b". When taking field measurements make sure data is collected with this in mind.

## Area of Plane Shapes

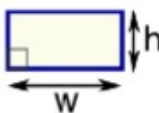
Learn more about [Area](#) or try the [Area Calculator](#).



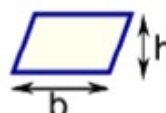
Triangle  
 $\text{Area} = \frac{1}{2} \times b \times h$   
 b = base  
 h = vertical height



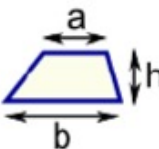
Square  
 $\text{Area} = a^2$   
 a = length of side



Rectangle  
 $\text{Area} = w \times h$   
 w = width  
 h = height



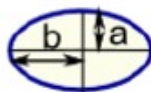
Parallelogram  
 $\text{Area} = b \times h$   
 b = base  
 h = vertical height



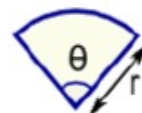
Trapezoid (US)  
Trapezium (UK)  
 $\text{Area} = \frac{1}{2}(a+b) \times h$   
 h = vertical height



Circle  
 $\text{Area} = \pi \times r^2$   
 $\text{Circumference} = 2 \times \pi \times r$   
 r = radius

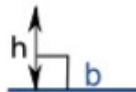


Ellipse  
 $\text{Area} = \pi ab$

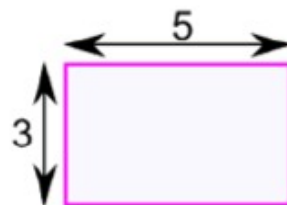


Sector  
 $\text{Area} = \frac{1}{2} \times r^2 \times \theta$   
 r = radius  
 $\theta$  = angle in radians

Note: h is at right angles to b:



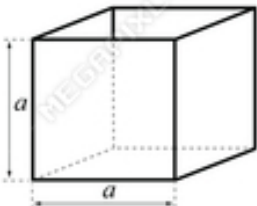
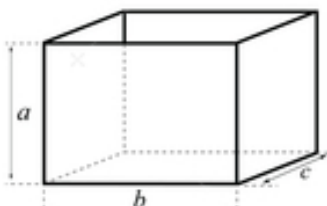
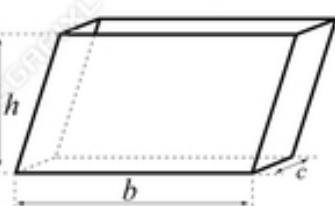
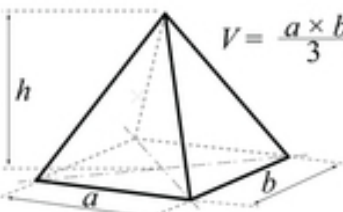
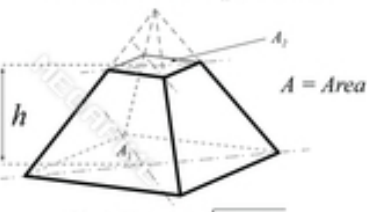
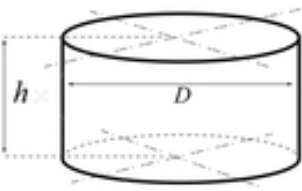
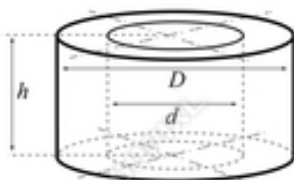

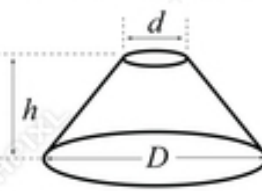
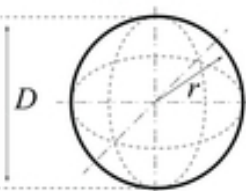
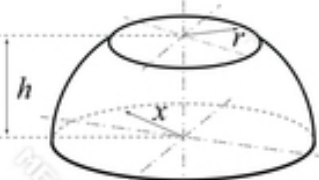
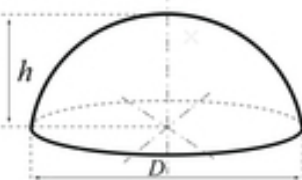
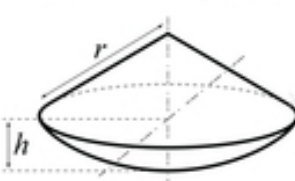
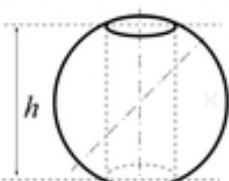
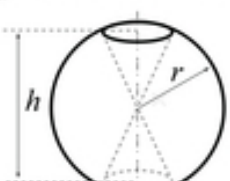

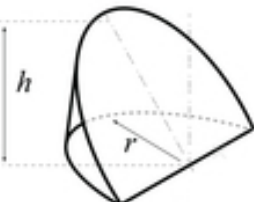
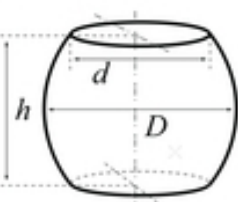
Example: What is the area of this rectangle?



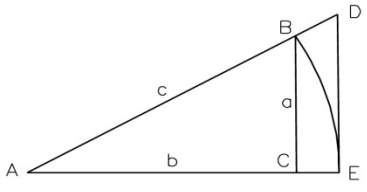
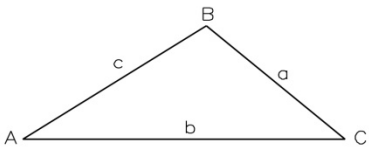
The formula is:

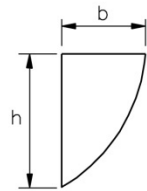

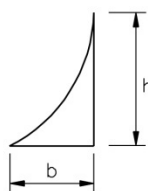
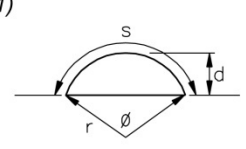
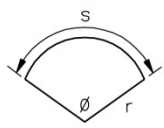
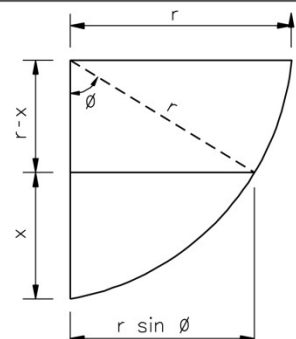
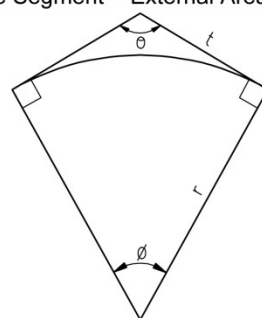
$\text{Area} = w \times h$   
 w = width  
 h = height

## Volume of 3D shapes

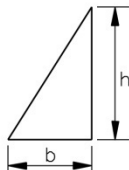
|   |   |   |
|---|---|---|
| <p><b>Cube</b></p>  <p><math>V = a^3</math></p>  | <p><b>Cuboid</b></p>  <p><math>V = a \times b \times c</math></p>  | <p><b>Parallelepiped</b></p>  <p><math>V = h \times b \times c</math></p>                          |
| <p><b>Pyramid</b></p>  <p><math>V = \frac{a \times b}{3} \times h</math></p>           | <p><b>Frustum of a pyramid</b></p>  <p><math>V = \frac{h(A_1 + A_2 + \sqrt{A_1 \times A_2})}{3}</math></p> | <p><b>Cylinder</b></p>  <p><math>V = \frac{1}{4}\pi D^2 h</math></p>                               |
| <p><b>Hollow Cylinder</b></p>  <p><math>V = \frac{1}{4}\pi(D^2 - d^2)h</math></p>     | <p><b>Cone</b></p>  <p><math>V = \frac{1}{3}\pi r^2 h</math></p>  | <p><b>Frustum of a Cone</b></p>  <p><math>V = \frac{\pi h(D^2 + Dd + d^2)}{12}</math></p>         |
| <p><b>Sphere</b></p>  <p><math>V = \frac{3\pi r^3}{3} = \frac{\pi D^3}{6}</math></p> | <p><b>Zone of a Sphere</b></p>  <p><math>V = \frac{\pi h(3r^2 + 3x^2 + h^2)}{6}</math></p>               | <p><b>Segment of a sphere</b></p>  <p><math>V = \frac{\pi h(\frac{3}{4}D^2 + h^2)}{6}</math></p> |
| <p><b>Sector of a Sphere</b></p>  <p><math>V = \frac{2\pi r^2 h}{3}</math></p>       | <p><b>Sphere with Cylinder</b></p>  <p><math>V = \frac{\pi h^3}{6}</math></p>                            | <p><b>Sphere with two cones</b></p>  <p><math>V = \frac{2\pi r^2 h}{3}</math></p>                |
| <p><b>Sliced Cylinder</b></p>  <p><math>V = \frac{\pi d^2 h}{4}</math></p>           | <p><b>Ungula</b></p>  <p><math>V = \frac{2r^2 h}{3}</math></p>   | <p><b>Barrel</b></p>  <p><math>V = \frac{\pi h(2D^2 + d^2)}{12}</math></p>                       |

This section presents mathematical formulas used by IDOT for various quantity determinations.

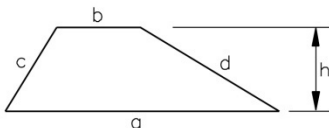
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Right Triangle</p> </div> <div style="text-align: center;">  <p>Oblique Triangle</p> </div> </div> |  |   |
|--|--|---|
| <b>Right Triangles</b>   |  |   |
| $\sin A = \frac{a}{c} = \cos B$ $\cos A = \frac{b}{c} = \sin B$ $\tan A = \frac{a}{b} = \cot B$ $a = c \sin A = c \cos B = b \tan A = b \cot B = \sqrt{c^2 - b^2}$ $b = c \cos A = c \sin B = a \cot A = a \tan B = \sqrt{c^2 - a^2}$ $c = \frac{a}{\sin A} = \frac{a}{\cos B} = \frac{b}{\sin B} = \frac{b}{\cos A}$  |  |   |
| $\sec A = \frac{c}{b} = \operatorname{cosec} B$ $\operatorname{cosec} A = \frac{c}{a} = \sec B$ $\cot A = \frac{b}{a} = \tan B$  |  |   |
| <b>Oblique Triangles</b>   |  |   |
| Given  | Sought                                       | Formula   |
| A, B, a  | b, c   | $b = \frac{a}{\sin A} \cdot \sin B$ $c = \frac{a}{\sin A} \cdot \sin (A+B)$   |
| A, a, b  | B, c   | $\sin B = \frac{\sin A}{a} \cdot b$ $c = \frac{a \sin (A + \arcsin (b \sin A / a))}{\sin A}$  |
| C, a, b  | $\frac{1}{2}(A + B)$<br>$\frac{1}{2}(A - B)$ | $\frac{1}{2}(A+B) = 90^\circ - \frac{1}{2}C$ $\tan \frac{1}{2}(A - B) = \frac{a - b}{a + b} \cdot \tan \frac{1}{2}(A+B)$  |
| a, b, c  | A  | <p>Given <math>s = \frac{1}{2}(a+b+c)</math>, then :</p> $\sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}}$ $\cos \frac{1}{2}A = \sqrt{\frac{s(s-a)}{bc}}$ $\tan \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ $\sin A = 2 \sqrt{\frac{s(s-a)(s-b)(s-c)}{bc}}$ |
|  | Area   | $\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$   |
| c, a, b  | Area   | $\text{Area} = \frac{1}{2} ab \sin C$   |

|  |   |
|--|---|
| <p><i>Nomenclature</i></p> <p>A = total surface area<br/> d = distance<br/> h = height<br/> p = perimeter<br/> r = radius<br/> s = side (edge) length, arc length<br/> V = volume<br/> <math>\theta</math> = vertex angle, in radians<br/> <math>\phi</math> = central angle, in radians</p>   | <p><i>Parabola</i></p>  <p><math>A = \frac{2bh}{3}</math></p>  |
| <p><i>Circle</i></p>  <p><math>p = 2\pi r</math><br/> <math>A = \pi r^2 = \frac{p^2}{4\pi}</math></p>   |  <p><math>A = \frac{1}{3}bh</math></p>   |
| <p><i>Circular Segment (1)</i></p>  <p><math>A = \frac{1}{2}r^2(\phi - \sin\phi)</math><br/> <math>\phi = \frac{s}{r} = 2\left(\arccos \frac{r-d}{r}\right)</math></p>  | <p><i>Circular Sector</i></p>  <p><math>A = \frac{1}{2}\phi r^2 = \frac{1}{2}sr</math><br/> <math>\phi = \frac{s}{r}</math></p>  |
| <p><i>Circular Segment (2)</i></p>  <p><math>\cos \phi = \frac{r-x}{r}</math></p> <p><u>Area of Circle Segment</u></p> <p><math>\frac{\phi}{360^\circ}\pi r^2</math></p> <p><u>Area of Triangle</u></p> <p><math>\frac{1}{2}(r-x)(r \sin \phi)</math></p> | <p><i>External Area</i></p> <p>Total Area - Area of Circle Segment = External Area</p>  <p><math>t = \frac{r}{\tan \frac{\theta}{2}}</math><br/> <math>\phi = 180^\circ - \theta</math><br/> Total Area = <math>rt = \frac{r^2}{\tan \frac{\theta}{2}}</math><br/> Area of Circle Seg. = <math>\pi r^2 \frac{\phi}{360}</math><br/> Ext. Area = <math>r^2 \left[ \frac{1}{\tan \frac{\theta}{2}} - \pi \frac{\phi}{360} \right]</math></p> |



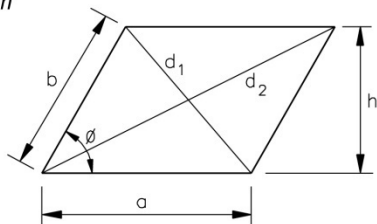
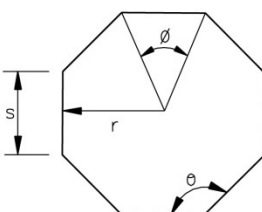
| Number of Sides | Name of Polygon | <div>Triangle</div> <div></div> <div><math>A = \frac{1}{2}bh</math></div> |
|-----------------|-----------------|--|
| 3               | triangle        |  |
| 4               | rectangle       |  |
| 5               | pentagon        |  |
| 6               | hexagon         |  |
| 7               | heptagon        |  |
| 8               | octagon         |  |
| 9               | nonagon         |  |
| 10              | decagon         |  |

Trapezoid



$$p = a + b + c + d$$
$$A = \frac{1}{2}h(a + b)$$

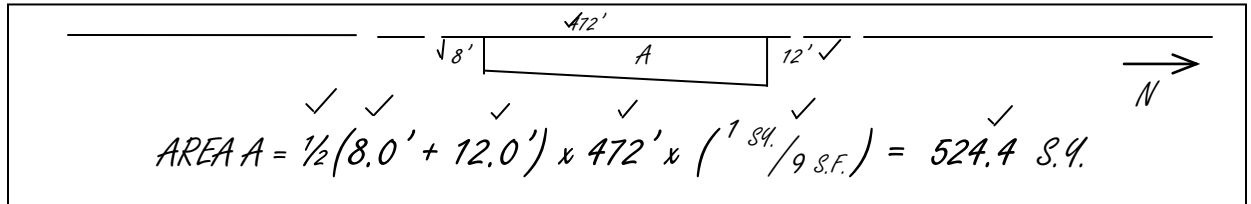
The trapezoid is isosceles if  $c = d$ .

| Parallelogram   | Regular Polygon   |
|---|---|
| <div></div> <div><math display="block">p = 2(a + b)</math><math display="block">d_1 = \sqrt{a^2 + b^2 - 2ab(\cos \phi)}</math><math display="block">d_2 = \sqrt{a^2 + b^2 + 2ab(\cos \phi)}</math><math display="block">d_1^2 + d_2^2 = 2(a^2 + b^2)</math><math display="block">A = ah = ab(\sin \phi)</math></div> <div>If <math>a = b</math>, the parallelogram is a rhombus.</div> | <div><div>(n equal sides)</div><div></div><div><math display="block">\phi = \frac{2\pi}{n}</math><math display="block">\theta = \frac{\pi(n - 2)}{n}</math><math display="block">p = ns</math><math display="block">s = 2r \left( \tan \left( \frac{\phi}{2} \right) \right)</math><math display="block">A = \frac{1}{2}nsr</math></div></div> |

**RECOMMENDED CHECKING PROCEDURES**

*The Checker assumes responsibility for all errors made by the Preparer that are not caught by the Checker!*

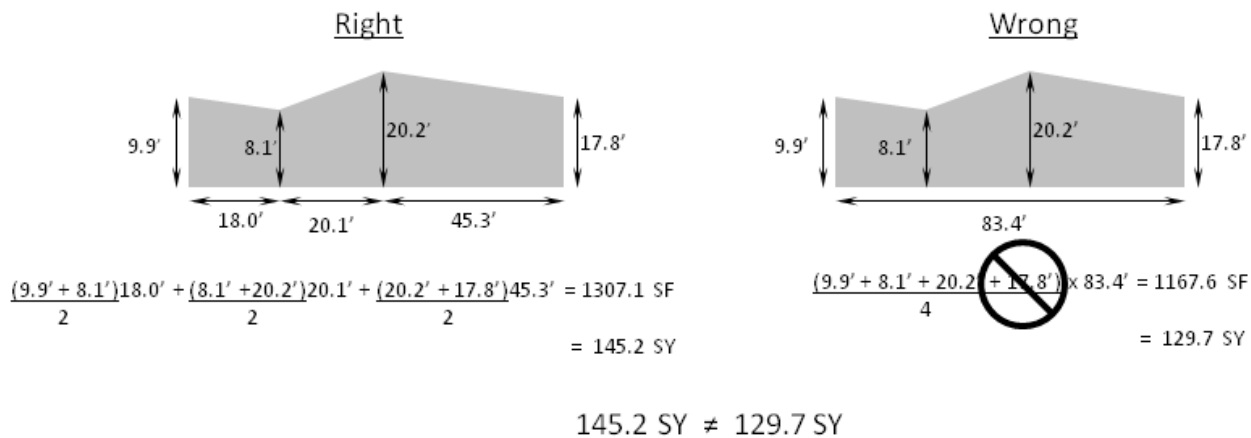
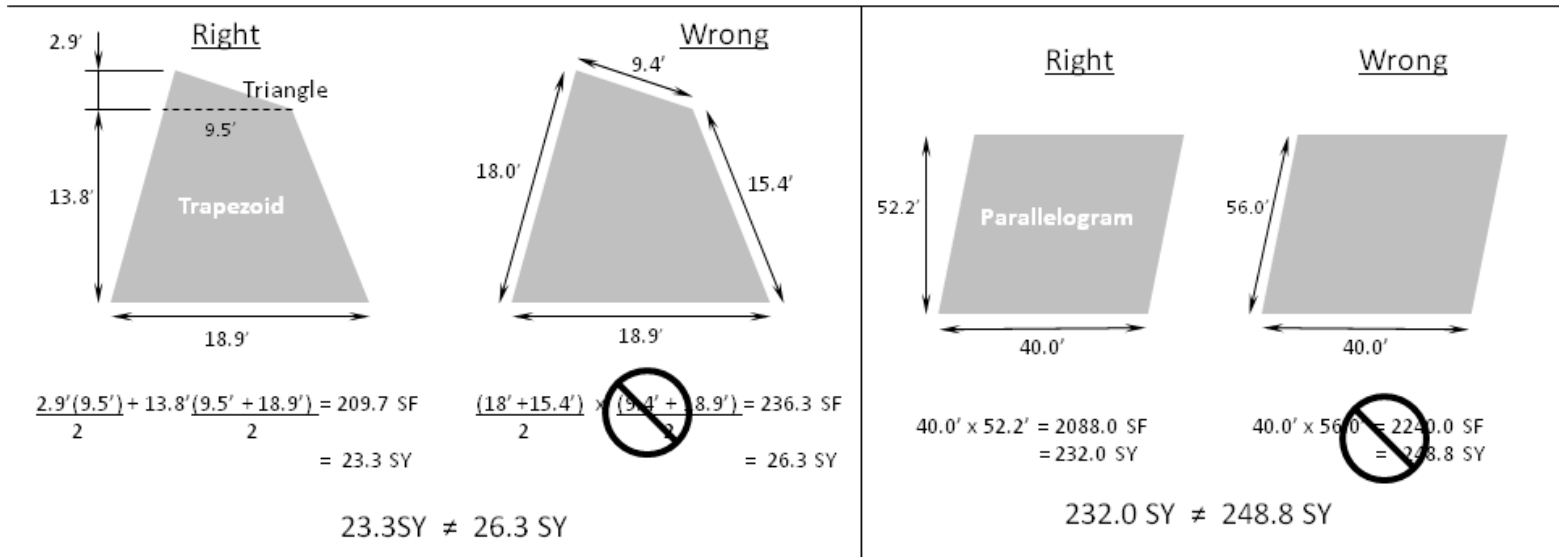
- DO NOT ERASE ERRORS! Cross out the original entry with a single line and correct.



- Show what you have checked by making small check marks.
- Checking involves much more than punching numbers into a calculator. The following is a partial list of things that the checker should be reviewing:
  - All items on any sketches were properly labeled, and the measurements were correctly transferred from the original sketch to the equations.
  - The correct equation was used.
  - The Stationing is correct.
  - The Pay Item, Pay Item Number, and Fund Code are correct.
  - All necessary yield checks have been made. You should also note if the yield is within the spec. *(If it is out of spec, then an explanation of the factors that would account for the deviation or actions that were taken should be noted.)*
  - The “Quantity and Units” column of the IDR matches the calculated value and the pay item requirements.
  - All numbers have been correctly rounded-off, in accordance with Section B of the Documentation Manual.
  - Each pay item is labeled as an “estimate” or a “final measurement.” (A final measurement is one that cannot or will not be re-measured.)
  - The date, Contractor/Subcontractor, weather, and job stamp information have been completed on the IDR.
  - “Measured by,” “Calculated by” and “Checked by” have been initialed and dated.
  - All tonnage and gallon tickets have been initialed, correctly tallied and bound.
  - The “Evidence of Inspection” has been completed in accordance with the PPG, or Section C of the Documentation Manual.

*Remember: “Any place a mistake might be made, sooner or later, it will be made!”*

*Break areas into geometric shapes that you can calculate & use the correct formulas!*



# Common Conversions

Acre = 43,560 sq ft

Weight of 1 gallon of water = 8.328 lb

Weight of 1 cubic foot of water = 62.4 lb

Weight of 1 gallon of liquid other than water = 8.328 lb/gal x Specific Gravity of material (Sp. Gr.)

Volume in gallons =  $\frac{\text{net weight of material, lb}}{8.328 \text{ lb/gal} \times \text{Sp. Gr.}}$

Pi  $\pi$  = 3.1416

Typical weight of HMA = 112 lb/sq yd/in

Typical weight of reinforced concrete = 150 pounds/cu ft

1 Square yard = 9 Square feet

1 Cubic yard = 27 Cubic feet

1 Ton = 2,000 Pounds

Other conversions can be found in the Appendix of the Standard Specifications for Road and Bridge Construction.

# Section E

## TRENCH BACKFILL TABLES FOR CONCRETE PIPES

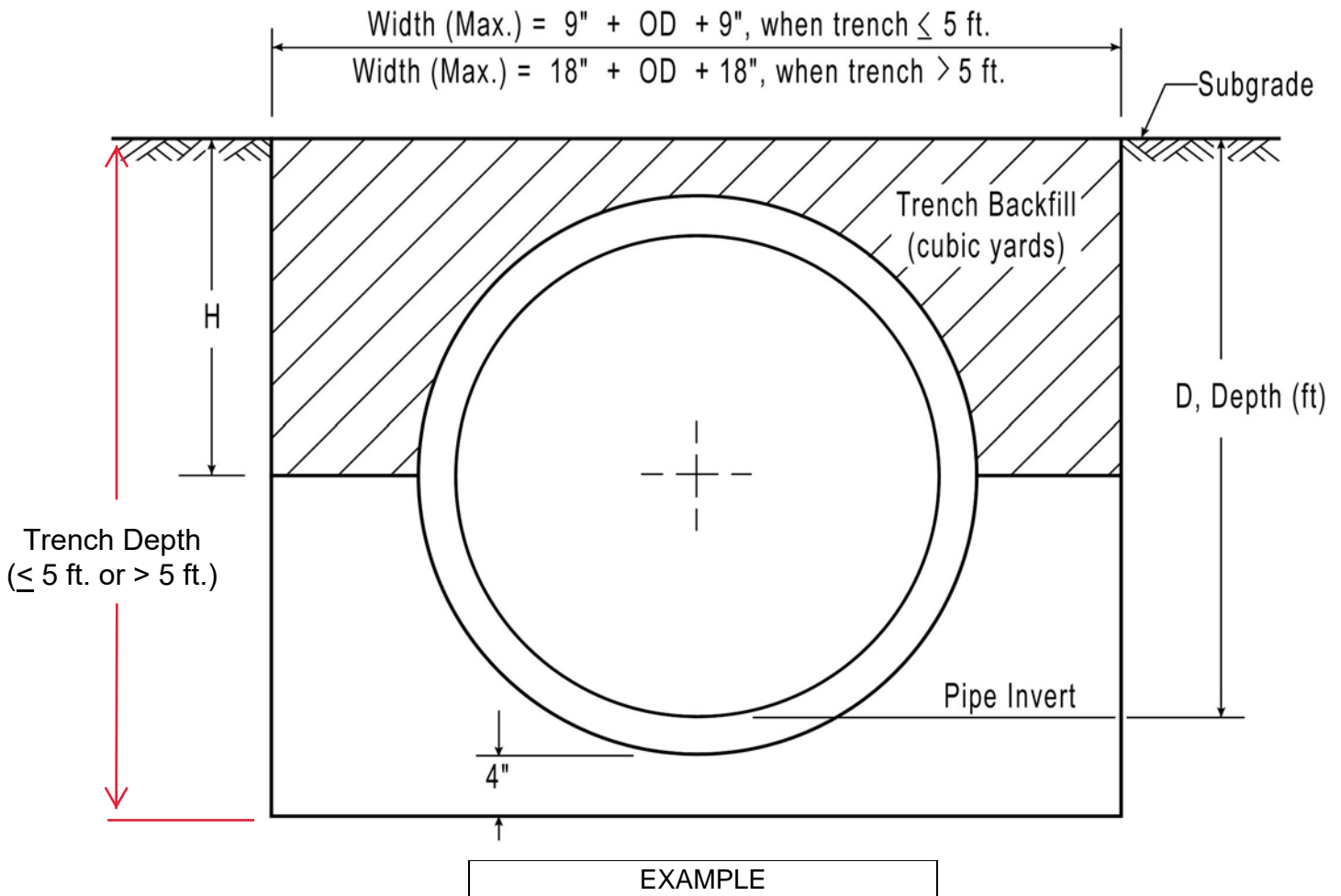
These tables can be used by the designer or the engineer to determine the volume of TRENCH BACKFILL that can be paid for when backfilling storm sewer trenches. Maximum trench widths adopted by the January 1, 2022 Standard Specifications are used.

**NOTE:** If the trench depth is 5ft. (1.5m) and less, with protection, the values included in the tables herein will be of no value. The engineer will have to calculate the actual volume of TRENCH BACKFILL using the formulas included within this section.

The calculated volumes are based on the use of standard **English sized pipes** which meet the tolerances of the Metric pay item.



# TRENCH BACKFILL TABLE FOR CIRCULAR CONCRETE PIPE, ENGLISH



Given: Pipe = 42" Storm Sewer  
 Average Depth, D = 6.8 feet  
 Trench Length = 84.7 feet

Find: Cubic Yards of TRENCH BACKFILL

Solution: From Table, Cubic yard/lin. ft. = 1.093  
 x Trench length = x 84.7  
 TRENCH BACKFILL = 92.6 cu. yds.

**NOTE:** If the field engineer measures a width of trench less than the maximum permitted, the values included herein will be of no value. The actual volume of TRENCH BACKFILL used will therefore have to be calculated using the following formula:

$$\text{Cubic Yards} = \left[ (H' \times W') - \left( \frac{\text{Pipe End Area}}{2} \right) \right] \times L' \times 1/27$$

# VOLUME OF TRENCH BACKFILL (CU.YDS.) PER LINEAL FT. OF STORM SEWER

| Inside Diameter<br>Wall thickness | 8"<br>1.667" | 10"<br>1.833" | 12"<br>2.00" | 15"<br>2.25" | 18"<br>2.50" | 21"<br>2.75" |
|-----------------------------------|--------------|---------------|--------------|--------------|--------------|--------------|
| 2.0                               | 0.138        | 0.136         | 0.132        | 0.121        | 0.105        | 0.083        |
| 2.2                               | 0.156        | 0.155         | 0.152        | 0.143        | 0.130        | 0.111        |
| 2.4                               | 0.174        | 0.175         | 0.173        | 0.167        | 0.155        | 0.138        |
| 2.6                               | 0.192        | 0.194         | 0.194        | 0.190        | 0.180        | 0.166        |
| 2.8                               | 0.210        | 0.214         | 0.215        | 0.213        | 0.205        | 0.193        |
| 3.0                               | 0.228        | 0.234         | 0.236        | 0.236        | 0.231        | 0.220        |
| 3.2                               | 0.246        | 0.253         | 0.257        | 0.259        | 0.256        | 0.248        |
| 3.4                               | 0.264        | 0.272         | 0.278        | 0.282        | 0.281        | 0.275        |
| 3.6                               | 0.282        | 0.292         | 0.299        | 0.305        | 0.307        | 0.303        |
| 3.8                               | 0.300        | 0.311         | 0.320        | 0.329        | 0.332        | 0.330        |
| 4.0                               | 0.319        | 0.331         | 0.341        | 0.352        | 0.358        | 0.358        |
| 4.2                               | 0.336        | 0.350         | 0.362        | 0.375        | 0.383        | 0.385        |
| 4.4                               | 0.354        | 0.370         | 0.383        | 0.398        | 0.408        | 0.413        |
| 4.6                               | 0.610        | 0.622         | 0.632        | 0.642        | 0.647        | 0.647        |
| 4.8                               | 0.639        | 0.653         | 0.664        | 0.676        | 0.684        | 0.686        |
| 5.0                               | 0.668        | 0.683         | 0.696        | 0.711        | 0.720        | 0.724        |
| 5.2                               | 0.698        | 0.714         | 0.728        | 0.745        | 0.756        | 0.763        |
| 5.4                               | 0.727        | 0.745         | 0.760        | 0.779        | 0.793        | 0.801        |
| 5.6                               | 0.756        | 0.776         | 0.792        | 0.813        | 0.829        | 0.840        |
| 5.8                               | 0.785        | 0.807         | 0.824        | 0.848        | 0.866        | 0.879        |
| 6.0                               | 0.815        | 0.837         | 0.856        | 0.882        | 0.902        | 0.918        |
| 6.2                               | 0.844        | 0.867         | 0.888        | 0.916        | 0.938        | 0.956        |
| 6.4                               | 0.873        | 0.898         | 0.921        | 0.950        | 0.975        | 0.994        |
| 6.6                               | 0.903        | 0.929         | 0.953        | 0.985        | 1.011        | 1.033        |
| 6.8                               | 0.932        | 0.959         | 0.985        | 1.019        | 1.048        | 1.071        |
| 7.0                               | 0.961        | 0.990         | 1.017        | 1.053        | 1.084        | 1.110        |
| 7.2                               | 0.990        | 1.021         | 1.049        | 1.087        | 1.121        | 1.149        |
| 7.4                               | 1.019        | 1.051         | 1.081        | 1.122        | 1.157        | 1.187        |
| 7.6                               | 1.049        | 1.082         | 1.113        | 1.156        | 1.193        | 1.226        |
| 7.8                               | 1.078        | 1.113         | 1.145        | 1.190        | 1.230        | 1.264        |
| 8.0                               | 1.107        | 1.143         | 1.177        | 1.224        | 1.266        | 1.303        |
| 8.2                               | 1.136        | 1.174         | 1.209        | 1.259        | 1.303        | 1.342        |
| 8.4                               | 1.165        | 1.205         | 1.241        | 1.293        | 1.340        | 1.380        |
| 8.6                               | 1.195        | 1.235         | 1.274        | 1.328        | 1.376        | 1.419        |
| 8.8                               | 1.224        | 1.266         | 1.306        | 1.362        | 1.412        | 1.458        |
| 9.0                               | 1.253        | 1.297         | 1.338        | 1.396        | 1.449        | 1.496        |
| 9.2                               | 1.282        | 1.327         | 1.370        | 1.430        | 1.485        | 1.535        |
| 9.4                               | 1.311        | 1.358         | 1.402        | 1.465        | 1.522        | 1.574        |
| 9.6                               | 1.341        | 1.389         | 1.435        | 1.499        | 1.558        | 1.612        |
| 9.8                               | 1.370        | 1.419         | 1.467        | 1.533        | 1.594        | 1.651        |
| 10.0                              | 1.399        | 1.450         | 1.499        | 1.568        | 1.631        | 1.689        |
| 10.2                              | 1.428        | 1.481         | 1.531        | 1.602        | 1.667        | 1.728        |
| 10.4                              | 1.457        | 1.511         | 1.563        | 1.636        | 1.704        | 1.767        |
| 10.6                              | 1.487        | 1.542         | 1.595        | 1.671        | 1.740        | 1.805        |
| 10.8                              | 1.516        | 1.573         | 1.627        | 1.705        | 1.776        | 1.844        |
| 11.0                              | 1.545        | 1.603         | 1.659        | 1.739        | 1.813        | 1.882        |
| 11.2                              | 1.574        | 1.634         | 1.691        | 1.773        | 1.849        | 1.921        |
| 11.4                              | 1.603        | 1.665         | 1.723        | 1.808        | 1.886        | 1.960        |
| 11.6                              | 1.633        | 1.696         | 1.755        | 1.842        | 1.922        | 1.998        |
| 11.8                              | 1.662        | 1.726         | 1.788        | 1.876        | 1.958        | 2.037        |
| For each additional 0.2' depth    |              |               |              |              |              |              |
|                                   | +0.0292      | +0.0307       | +0.0321      | +0.0343      | +0.0364      | +0.0386      |



# VOLUME OF TRENCH BACKFILL (CU.YDS.) PER LINEAL FT. OF STORM SEWER

| Inside Diameter<br>Wall thickness | 24"<br>3.00" | 27"<br>3.25" | 30"<br>3.50" | 33"<br>3.75" | 36"<br>4.00" | 42"<br>4.50" |
|-----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 2.4                               | 0.116        |              |              |              |              |              |
| 2.6                               | 0.146        | 0.121        |              |              |              |              |
| 2.8                               | 0.175        | 0.152        | 0.124        |              |              |              |
| 3.0                               | 0.205        | 0.184        | 0.158        |              |              |              |
| 3.2                               | 0.235        | 0.216        | 0.192        | 0.163        |              |              |
| 3.4                               | 0.264        | 0.248        | 0.226        | 0.199        | 0.168        |              |
| 3.6                               | 0.294        | 0.280        | 0.260        | 0.236        | 0.206        |              |
| 3.8                               | 0.323        | 0.311        | 0.294        | 0.272        | 0.244        |              |
| 4.0                               | 0.353        | 0.343        | 0.328        | 0.308        | 0.282        | 0.216        |
| 4.2                               | 0.383        | 0.375        | 0.362        | 0.344        | 0.321        | 0.259        |
| 4.4                               | 0.412        | 0.407        | 0.571        | 0.548        | 0.520        | 0.448        |
| 4.6                               | 0.642        | 0.632        | 0.616        | 0.595        | 0.569        | 0.502        |
| 4.8                               | 0.683        | 0.674        | 0.661        | 0.643        | 0.619        | 0.556        |
| 5.0                               | 0.723        | 0.717        | 0.706        | 0.690        | 0.668        | 0.610        |
| 5.2                               | 0.764        | 0.760        | 0.751        | 0.737        | 0.718        | 0.663        |
| 5.4                               | 0.805        | 0.803        | 0.796        | 0.784        | 0.767        | 0.717        |
| 5.6                               | 0.846        | 0.846        | 0.841        | 0.831        | 0.816        | 0.771        |
| 5.8                               | 0.886        | 0.889        | 0.886        | 0.879        | 0.866        | 0.824        |
| 6.0                               | 0.927        | 0.932        | 0.931        | 0.926        | 0.915        | 0.878        |
| 6.2                               | 0.968        | 0.975        | 0.976        | 0.973        | 0.964        | 0.932        |
| 6.4                               | 1.009        | 1.018        | 1.022        | 1.020        | 1.014        | 0.985        |
| 6.6                               | 1.049        | 1.061        | 1.067        | 1.068        | 1.063        | 1.039        |
| 6.8                               | 1.090        | 1.103        | 1.112        | 1.115        | 1.113        | 1.093        |
| 7.0                               | 1.131        | 1.146        | 1.157        | 1.162        | 1.162        | 1.147        |
| 7.2                               | 1.172        | 1.189        | 1.202        | 1.209        | 1.211        | 1.200        |
| 7.4                               | 1.212        | 1.232        | 1.247        | 1.256        | 1.261        | 1.254        |
| 7.6                               | 1.253        | 1.275        | 1.292        | 1.304        | 1.310        | 1.308        |
| 7.8                               | 1.294        | 1.318        | 1.337        | 1.351        | 1.359        | 1.361        |
| 8.0                               | 1.335        | 1.361        | 1.382        | 1.398        | 1.409        | 1.415        |
| 8.2                               | 1.375        | 1.404        | 1.427        | 1.445        | 1.458        | 1.469        |
| 8.4                               | 1.416        | 1.447        | 1.473        | 1.493        | 1.508        | 1.523        |
| 8.6                               | 1.457        | 1.490        | 1.518        | 1.540        | 1.557        | 1.577        |
| 8.8                               | 1.498        | 1.533        | 1.563        | 1.587        | 1.607        | 1.630        |
| 9.0                               | 1.539        | 1.576        | 1.608        | 1.635        | 1.656        | 1.684        |
| 9.2                               | 1.579        | 1.619        | 1.653        | 1.682        | 1.706        | 1.738        |
| 9.4                               | 1.620        | 1.662        | 1.698        | 1.729        | 1.755        | 1.791        |
| 9.6                               | 1.661        | 1.704        | 1.743        | 1.776        | 1.804        | 1.845        |
| 9.8                               | 1.701        | 1.747        | 1.788        | 1.823        | 1.854        | 1.899        |
| 10.0                              | 1.742        | 1.790        | 1.833        | 1.871        | 1.903        | 1.953        |
| 10.2                              | 1.783        | 1.833        | 1.878        | 1.918        | 1.953        | 2.006        |
| 10.4                              | 1.824        | 1.876        | 1.924        | 1.965        | 2.002        | 2.060        |
| 10.6                              | 1.864        | 1.919        | 1.968        | 2.012        | 2.051        | 2.114        |
| 10.8                              | 1.905        | 1.962        | 2.013        | 2.060        | 2.100        | 2.167        |
| 11.0                              | 1.946        | 2.005        | 2.058        | 2.107        | 2.150        | 2.221        |
| 11.2                              | 1.987        | 2.048        | 2.103        | 2.154        | 2.199        | 2.275        |
| 11.4                              | 2.028        | 2.091        | 2.148        | 2.201        | 2.249        | 2.328        |
| 11.6                              | 2.068        | 2.133        | 2.193        | 2.249        | 2.298        | 2.382        |
| 11.8                              | 2.109        | 2.176        | 2.239        | 2.296        | 2.347        | 2.436        |
| 12.0                              | 2.150        | 2.219        | 2.284        | 2.343        | 2.397        | 2.490        |
| 12.2                              | 2.191        | 2.262        | 2.329        | 2.390        | 2.446        | 2.543        |
| For each additional 0.2' depth:   |              |              |              |              |              |              |
|                                   | +0.0407      | +0.0429      | +0.0451      | +0.0472      | +0.0494      | +0.0537      |

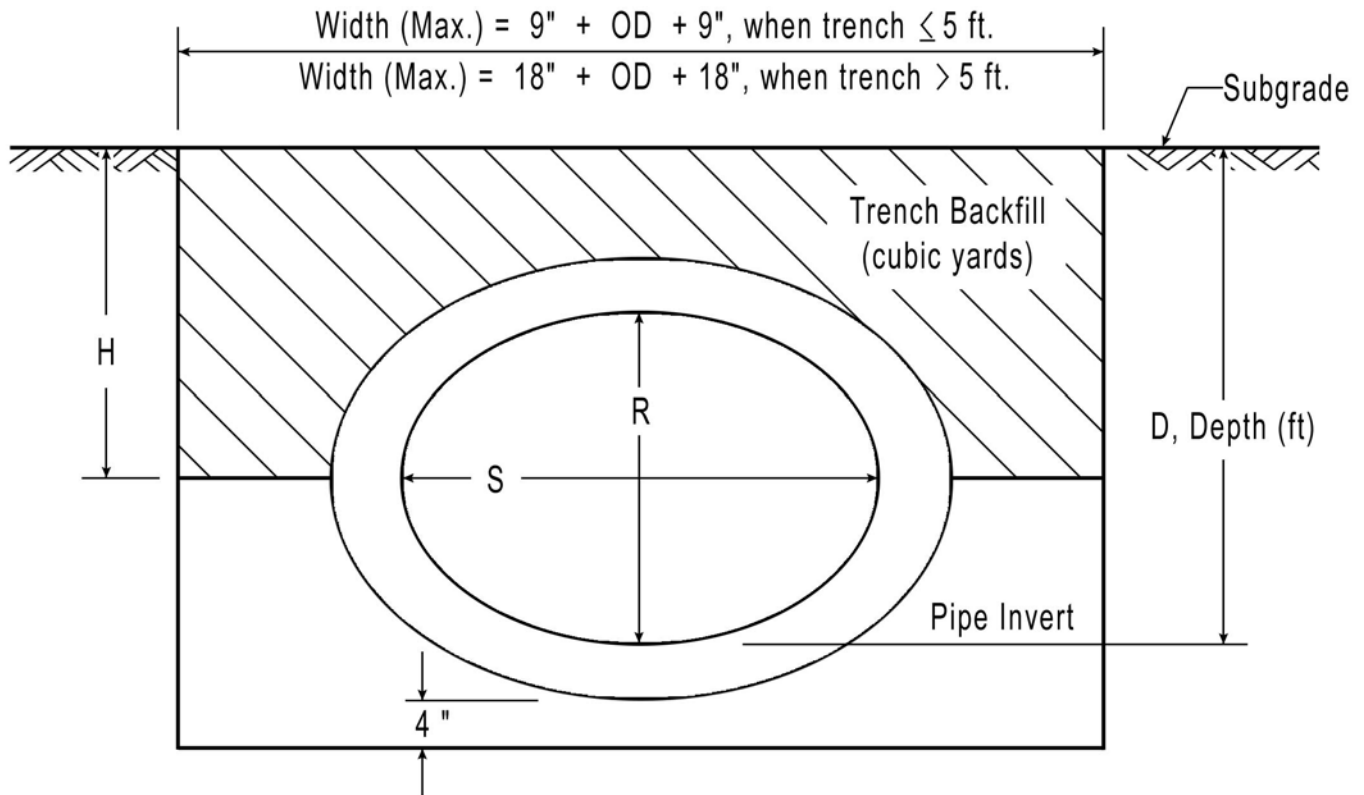
# VOLUME OF TRENCH BACKFILL (CU.YDS.) PER LINEAL FT. OF STORM SEWER

| Inside Diameter<br>Wall thickness | 48"<br>5.00" | 54"<br>5.50" | 60"<br>6.00" | 66"<br>6.50" | 72"<br>7.00" | 78"<br>7.50" |
|-----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 4.6                               | 0.414        |              |              |              |              |              |
| 4.8                               | 0.472        |              |              |              |              |              |
| 5.0                               | 0.530        | 0.430        |              |              |              |              |
| 5.2                               | 0.588        | 0.492        |              |              |              |              |
| 5.4                               | 0.646        | 0.555        |              |              |              |              |
| 5.6                               | 0.704        | 0.617        | 0.509        |              |              |              |
| 5.8                               | 0.762        | 0.679        | 0.576        |              |              |              |
| 6.0                               | 0.820        | 0.742        | 0.643        |              |              |              |
| 6.2                               | 0.878        | 0.804        | 0.709        | 0.594        |              |              |
| 6.4                               | 0.936        | 0.866        | 0.776        | 0.665        |              |              |
| 6.6                               | 0.994        | 0.929        | 0.843        | 0.736        | 0.608        |              |
| 6.8                               | 1.052        | 0.991        | 0.909        | 0.807        | 0.683        |              |
| 7.0                               | 1.110        | 1.053        | 0.976        | 0.878        | 0.759        |              |
| 7.2                               | 1.168        | 1.116        | 1.043        | 0.949        | 0.834        | 0.699        |
| 7.4                               | 1.226        | 1.178        | 1.109        | 1.020        | 0.909        | 0.778        |
| 7.6                               | 1.284        | 1.240        | 1.176        | 1.091        | 0.985        | 0.858        |
| 7.8                               | 1.342        | 1.303        | 1.243        | 1.162        | 1.060        | 0.938        |
| 8.0                               | 1.400        | 1.365        | 1.309        | 1.233        | 1.135        | 1.017        |
| 8.2                               | 1.458        | 1.428        | 1.376        | 1.304        | 1.211        | 1.097        |
| 8.4                               | 1.517        | 1.490        | 1.443        | 1.375        | 1.286        | 1.177        |
| 8.6                               | 1.575        | 1.553        | 1.510        | 1.446        | 1.362        | 1.257        |
| 8.8                               | 1.633        | 1.615        | 1.576        | 1.517        | 1.437        | 1.336        |
| 9.0                               | 1.691        | 1.677        | 1.643        | 1.588        | 1.512        | 1.416        |
| 9.2                               | 1.749        | 1.739        | 1.710        | 1.659        | 1.588        | 1.495        |
| 9.4                               | 1.807        | 1.802        | 1.776        | 1.730        | 1.663        | 1.575        |
| 9.6                               | 1.865        | 1.864        | 1.843        | 1.801        | 1.738        | 1.655        |
| 9.8                               | 1.923        | 1.927        | 1.910        | 1.872        | 1.813        | 1.734        |
| 10.0                              | 1.981        | 1.989        | 1.977        | 1.943        | 1.889        | 1.814        |
| 10.2                              | 2.039        | 2.051        | 2.043        | 2.014        | 1.964        | 1.893        |
| 10.4                              | 2.097        | 2.113        | 2.110        | 2.085        | 2.039        | 1.973        |
| 10.6                              | 2.155        | 2.176        | 2.177        | 2.156        | 2.115        | 2.053        |
| 10.8                              | 2.213        | 2.238        | 2.243        | 2.227        | 2.190        | 2.132        |
| 11.0                              | 2.271        | 2.300        | 2.310        | 2.298        | 2.265        | 2.212        |
| 11.2                              | 2.329        | 2.363        | 2.377        | 2.369        | 2.341        | 2.292        |
| 11.4                              | 2.387        | 2.425        | 2.443        | 2.440        | 2.416        | 2.371        |
| 11.6                              | 2.445        | 2.487        | 2.509        | 2.511        | 2.491        | 2.451        |
| 11.8                              | 2.503        | 2.550        | 2.576        | 2.582        | 2.566        | 2.531        |
| 12.0                              | 2.561        | 2.612        | 2.643        | 2.653        | 2.642        | 2.610        |
| 12.2                              | 2.619        | 2.675        | 2.709        | 2.724        | 2.717        | 2.690        |
| 12.4                              | 2.677        | 2.738        | 2.776        | 2.795        | 2.792        | 2.770        |
| 12.6                              | 2.735        | 2.800        | 2.843        | 2.866        | 2.868        | 2.849        |
| 12.8                              | 2.793        | 2.862        | 2.909        | 2.937        | 2.943        | 2.929        |
| 13.0                              | 2.852        | 2.925        | 2.976        | 3.008        | 3.018        | 3.008        |
| 13.2                              | 2.910        | 2.987        | 3.043        | 3.079        | 3.094        | 3.088        |
| 13.4                              | 2.968        | 3.049        | 3.110        | 3.150        | 3.169        | 3.168        |
| 13.6                              | 3.026        | 3.111        | 3.176        | 3.221        | 3.244        | 3.247        |
| 13.8                              | 3.084        | 3.174        | 3.243        | 3.292        | 3.320        | 3.327        |
| 14.0                              | 3.142        | 3.236        | 3.310        | 3.363        | 3.395        | 3.407        |
| 14.2                              | 3.200        | 3.298        | 3.376        | 3.434        | 3.470        | 3.486        |
| 14.4                              | 3.258        | 3.361        | 3.443        | 3.505        | 3.545        | 3.566        |
| For each additional 0.2' depth    |              |              |              |              |              |              |
|                                   | +0.0580      | +0.0623      | +0.0667      | +0.0710      | +0.0753      | +0.0796      |

# VOLUME OF TRENCH BACKFILL (CU.YDS.) PER LINEAL FT. OF STORM SEWER

| Inside Diameter<br>Wall thickness | 84"<br>8.00" | 90"<br>8.50" | 96"<br>9.00" | 102"<br>9.50" | 108"<br>10.00" |
|-----------------------------------|--------------|--------------|--------------|---------------|----------------|
| 7.8                               | 0.795        |              |              |               |                |
| 8.0                               | 0.879        |              |              |               |                |
| 8.2                               | 0.963        |              |              |               |                |
| 8.4                               | 1.047        | 0.896        |              |               |                |
| 8.6                               | 1.131        | 0.984        |              |               |                |
| 8.8                               | 1.215        | 1.073        | 0.910        | 0.726         | 0.522          |
| 9.0                               | 1.299        | 1.161        | 1.002        | 0.823         | 0.623          |
| 9.2                               | 1.382        | 1.249        | 1.095        | 0.920         | 0.724          |
| 9.4                               | 1.466        | 1.338        | 1.187        | 1.017         | 0.825          |
| 9.6                               | 1.550        | 1.426        | 1.280        | 1.114         | 0.927          |
| 9.8                               | 1.634        | 1.514        | 1.373        | 1.211         | 1.028          |
| 10.0                              | 1.718        | 1.602        | 1.467        | 1.307         | 1.129          |
| 10.2                              | 1.802        | 1.690        | 1.558        | 1.404         | 1.230          |
| 10.4                              | 1.886        | 1.778        | 1.650        | 1.501         | 1.331          |
| 10.6                              | 1.970        | 1.866        | 1.743        | 1.598         | 1.433          |
| 10.8                              | 2.054        | 1.955        | 1.835        | 1.695         | 1.534          |
| 11.0                              | 2.138        | 2.043        | 1.928        | 1.792         | 1.635          |
| 11.2                              | 2.222        | 2.131        | 2.021        | 1.889         | 1.737          |
| 11.4                              | 2.306        | 2.220        | 2.113        | 1.986         | 1.838          |
| 11.6                              | 2.390        | 2.308        | 2.206        | 2.083         | 1.939          |
| 11.8                              | 2.474        | 2.396        | 2.298        | 2.180         | 2.040          |
| 12.0                              | 2.558        | 2.485        | 2.391        | 2.277         | 2.141          |
| 12.2                              | 2.642        | 2.573        | 2.484        | 2.374         | 2.243          |
| 12.4                              | 2.726        | 2.661        | 2.576        | 2.471         | 2.344          |
| 12.6                              | 2.810        | 2.749        | 2.669        | 2.567         | 2.445          |
| 12.8                              | 2.894        | 2.838        | 2.761        | 2.664         | 2.547          |
| 13.0                              | 2.978        | 2.926        | 2.854        | 2.761         | 2.648          |
| 13.2                              | 3.062        | 3.014        | 2.947        | 2.858         | 2.749          |
| 13.4                              | 3.146        | 3.102        | 3.039        | 2.955         | 2.850          |
| 13.6                              | 3.230        | 3.191        | 3.132        | 3.052         | 2.951          |
| 13.8                              | 3.314        | 3.279        | 3.224        | 3.149         | 3.053          |
| 14.0                              | 3.398        | 3.367        | 3.317        | 3.246         | 3.154          |
| 14.2                              | 3.482        | 3.455        | 3.410        | 3.343         | 3.255          |
| 14.4                              | 3.566        | 3.544        | 3.502        | 3.440         | 3.357          |
| 14.6                              | 3.649        | 3.632        | 3.595        | 3.537         | 3.458          |
| 14.8                              | 3.733        | 3.720        | 3.687        | 3.634         | 3.559          |
| 15.0                              | 3.817        | 3.809        | 3.780        | 3.730         | 3.660          |
| 15.2                              | 3.901        | 3.897        | 3.873        | 3.827         | 3.761          |
| 15.4                              | 3.985        | 3.985        | 3.965        | 3.924         | 3.863          |
| 15.6                              | 4.069        | 4.074        | 4.058        | 4.021         | 3.964          |
| 15.8                              | 4.153        | 4.162        | 4.150        | 4.118         | 4.065          |
| 16.0                              | 4.237        | 4.250        | 4.243        | 4.215         | 4.166          |
| 16.2                              | 4.321        | 4.338        | 4.335        | 4.312         | 4.268          |
| 16.4                              | 4.405        | 4.426        | 4.428        | 4.409         | 4.369          |
| 16.6                              | 4.488        | 4.515        | 4.521        | 4.506         | 4.470          |
| 16.8                              | 4.572        | 4.603        | 4.613        | 4.603         | 4.571          |
| 17.0                              | 4.656        | 4.691        | 4.706        | 4.699         | 4.672          |
| 17.2                              | 4.740        | 4.780        | 4.798        | 4.796         | 4.774          |
| 17.4                              | 4.824        | 4.868        | 4.891        | 4.893         | 4.875          |
| 17.6                              | 4.908        | 4.956        | 4.984        | 4.990         | 4.976          |
| For each additional 0.2' depth:   |              |              |              |               |                |
|                                   | +0.0839      | +0.0883      | +0.0926      | +0.0969       | +0.1012        |

# TRENCH BACKFILL TABLE FOR ELLIPTICAL PIPES, ENGLISH



## EXAMPLE

Given: Pipe = 38" rise x 60" span, Storm Sewer

Average Depth, D = 4.6 feet

Trench Length = 82.5 feet

Find: Cubic Yards of TRENCH BACKFILL

Solution: From Table, Cubic yard/lin. ft. = 0.645

x Trench length = x 82.5

TRENCH BACKFILL = 53.2 cu. yds.

**NOTE:** If the field engineer measures a width of trench less than the maximum permitted, the values included herein will be of no value. The actual volume of TRENCH BACKFILL used will therefore have to be calculated using the following formula:

$$\text{Cubic Yards} = \left[ (H' \times W') - \left( \frac{\text{Pipe End Area}}{2} \right) \right] \times L' \times 1/27$$

**VOLUME OF TRENCH BACKFILL (CU. YDS)  
PER LINEAL FOOT OF ELLIPTICAL STORM SEWER PIPE**

|                                   |        |        |        |        |        |        |        |        |
|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Eq. Round Size, in.               | 18     | 24     | 27     | 30     | 33     | 36     | 39     | 42     |
| Rise, in.                         | 14     | 19     | 22     | 24     | 27     | 29     | 32     | 34     |
| Span, in.                         | 23     | 30     | 34     | 38     | 42     | 45     | 49     | 53     |
| Wall Thickness, in.               | 2.75   | 3.25   | 3.50   | 3.75   | 3.75   | 4.50   | 4.75   | 5.00   |
| Pipe End Area, sq. ft.            | 3.03   | 5.08   | 6.49   | 7.82   | 9.31   | 11.19  | 13.24  | 15.12  |
| 1.4                               | 0.061  |        |        |        |        |        |        |        |
| 1.6                               | 0.090  |        |        |        |        |        |        |        |
| 1.8                               | 0.118  |        |        |        |        |        |        |        |
| 2.0                               | 0.147  | 0.109  |        |        |        |        |        |        |
| 2.2                               | 0.176  | 0.143  | 0.114  |        |        |        |        |        |
| 2.4                               | 0.205  | 0.177  | 0.150  | 0.130  |        |        |        |        |
| 2.6                               | 0.233  | 0.210  | 0.186  | 0.169  | 0.135  |        |        |        |
| 2.8                               | 0.262  | 0.244  | 0.223  | 0.208  | 0.176  | 0.146  |        |        |
| 3.0                               | 0.291  | 0.277  | 0.259  | 0.247  | 0.218  | 0.191  |        |        |
| 3.2                               | 0.319  | 0.311  | 0.296  | 0.286  | 0.260  | 0.235  | 0.196  |        |
| 3.4                               | 0.348  | 0.345  | 0.332  | 0.326  | 0.301  | 0.280  | 0.243  | 0.216  |
| 3.6                               | 0.377  | 0.378  | 0.369  | 0.365  | 0.343  | 0.324  | 0.290  | 0.266  |
| 3.8                               | 0.406  | 0.412  | 0.405  | 0.404  | 0.385  | 0.369  | 0.337  | 0.316  |
| 4.0                               | 0.434  | 0.446  | 0.441  | 0.443  | 0.426  | 0.413  | 0.384  | 0.366  |
| 4.2                               | 0.463  | 0.479  | 0.478  | 0.482  | 0.468  | 0.458  | 0.432  | 0.416  |
| 4.4                               | 0.492  | 0.713  | 0.708  | 0.710  | 0.692  | 0.679  | 0.649  | 0.632  |
| 4.6                               | 0.743  | 0.758  | 0.755  | 0.761  | 0.745  | 0.735  | 0.708  | 0.693  |
| 4.8                               | 0.783  | 0.803  | 0.803  | 0.811  | 0.797  | 0.790  | 0.766  | 0.754  |
| 5.0                               | 0.823  | 0.848  | 0.805  | 0.861  | 0.850  | 0.846  | 0.824  | 0.815  |
| 5.2                               | 0.863  | 0.892  | 0.898  | 0.912  | 0.903  | 0.902  | 0.883  | 0.876  |
| 5.4                               | 0.903  | 0.937  | 0.945  | 0.962  | 0.956  | 0.957  | 0.941  | 0.937  |
| 5.6                               | 0.943  | 0.982  | 0.993  | 1.012  | 1.008  | 1.013  | 0.999  | 0.998  |
| 5.8                               | 0.982  | 1.027  | 1.040  | 1.063  | 1.061  | 1.068  | 1.058  | 1.059  |
| 6.0                               | 1.022  | 1.071  | 1.088  | 1.113  | 1.114  | 1.124  | 1.116  | 1.120  |
| 6.2                               | 1.062  | 1.116  | 1.136  | 1.163  | 1.167  | 1.179  | 1.174  | 1.182  |
| 6.4                               | 1.102  | 1.161  | 1.183  | 1.214  | 1.220  | 1.235  | 1.233  | 1.243  |
| 6.6                               | 1.142  | 1.206  | 1.231  | 1.264  | 1.272  | 1.290  | 1.291  | 1.304  |
| 6.8                               | 1.181  | 1.250  | 1.278  | 1.314  | 1.325  | 1.346  | 1.349  | 1.365  |
| 7.0                               | 1.221  | 1.295  | 1.326  | 1.364  | 1.378  | 1.402  | 1.408  | 1.426  |
| 7.2                               | 1.261  | 1.340  | 1.373  | 1.415  | 1.431  | 1.457  | 1.466  | 1.487  |
| 7.4                               | 1.301  | 1.385  | 1.421  | 1.465  | 1.483  | 1.513  | 1.524  | 1.548  |
| 7.6                               | 1.341  | 1.429  | 1.468  | 1.515  | 1.536  | 1.568  | 1.583  | 1.609  |
| 7.8                               | 1.381  | 1.474  | 1.516  | 1.566  | 1.589  | 1.624  | 1.641  | 1.670  |
| 8.0                               | 1.420  | 1.519  | 1.563  | 1.616  | 1.642  | 1.679  | 1.699  | 1.732  |
| 8.2                               | 1.460  | 1.564  | 1.611  | 1.666  | 1.695  | 1.735  | 1.758  | 1.793  |
| 8.4                               | 1.500  | 1.608  | 1.658  | 1.717  | 1.747  | 1.790  | 1.816  | 1.854  |
| 8.6                               | 1.540  | 1.653  | 1.706  | 1.767  | 1.800  | 1.846  | 1.874  | 1.915  |
| 8.8                               | 1.580  | 1.698  | 1.753  | 1.817  | 1.853  | 1.902  | 1.933  | 1.976  |
| 9.0                               | 1.619  | 1.743  | 1.801  | 1.868  | 1.906  | 1.957  | 1.991  | 2.037  |
| For each additional 0.2 ft. depth |        |        |        |        |        |        |        |        |
|                                   | +0.040 | +0.045 | +0.048 | +0.050 | +0.053 | +0.056 | +0.058 | +0.061 |

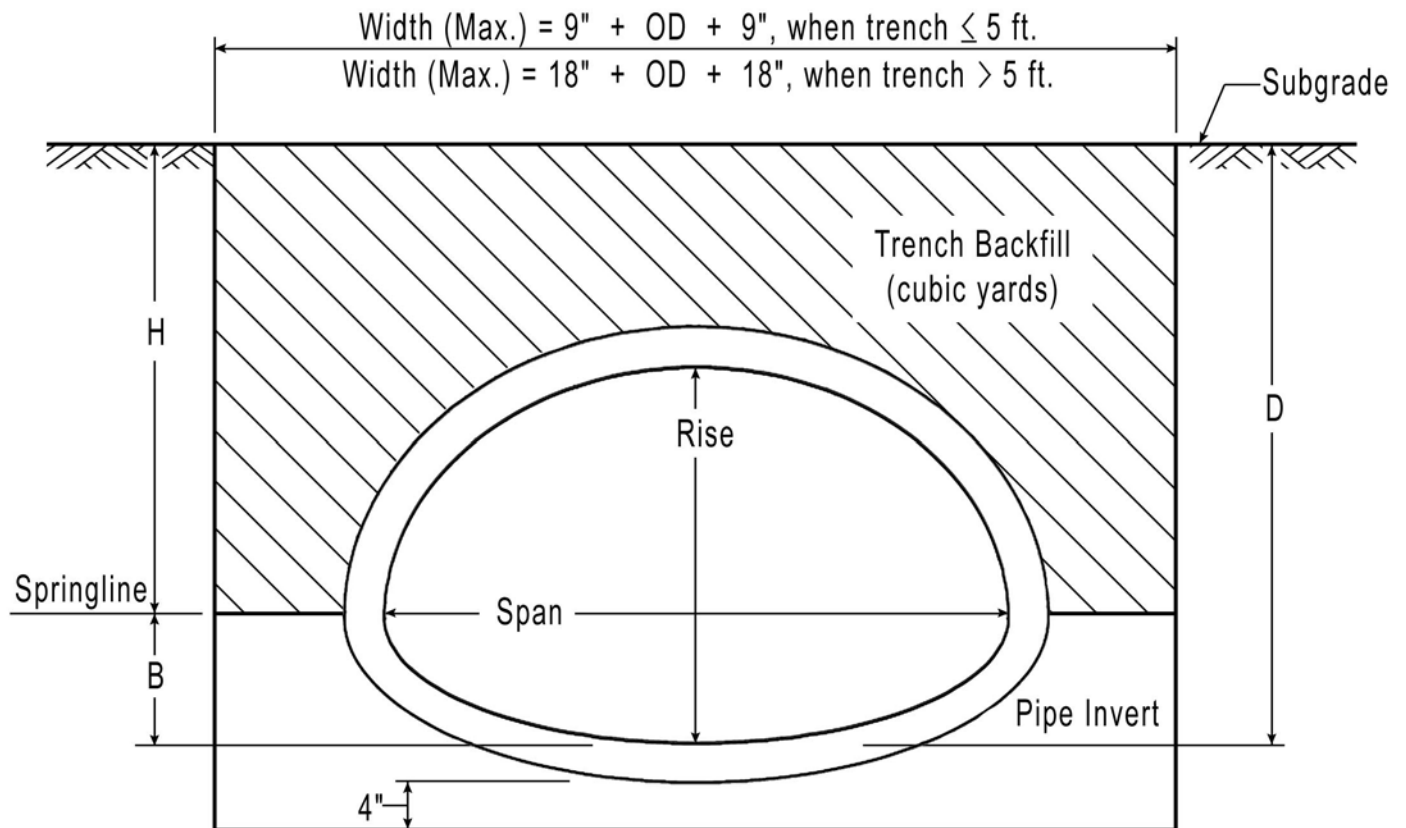
**VOLUME OF TRENCH BACKFILL (CU. YDS)  
PER LINEAL FOOT OF ELLIPTICAL STORM SEWER PIPE**

| Eq. Round Size, in.                | 48     | 54     | 60     | 66     | 72     | 78     | 84     | 90     |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Rise, in.                          | 38     | 43     | 48     | 53     | 58     | 63     | 68     | 72     |
| Span, in.                          | 60     | 68     | 76     | 83     | 91     | 98     | 106    | 113    |
| Wall Thickness, in.                | 5.50   | 6.00   | 6.50   | 7.00   | 7.50   | 8.00   | 8.50   | 9.00   |
| Pipe End Area, sq. ft.             | 18.98  | 24.00  | 29.61  | 35.45  | 42.20  | 49.12  | 57.02  | 64.30  |
| 3.8                                | 0.258  |        |        |        |        |        |        |        |
| 4.0                                | 0.312  |        |        |        |        |        |        |        |
| 4.2                                | 0.367  | 0.418  |        |        |        |        |        |        |
| 4.4                                | 0.579  | 0.489  |        |        |        |        |        |        |
| 4.6                                | 0.645  | 0.561  | 0.455  |        |        |        |        |        |
| 4.8                                | 0.711  | 0.633  | 0.532  |        |        |        |        |        |
| 5.0                                | 0.777  | 0.704  | 0.609  | 0.490  |        |        |        |        |
| 5.2                                | 0.843  | 0.776  | 0.686  | 0.572  |        |        |        |        |
| 5.4                                | 0.909  | 0.847  | 0.763  | 0.654  |        |        |        |        |
| 5.6                                | 0.975  | 0.919  | 0.841  | 0.736  | 0.614  |        |        |        |
| 5.8                                | 1.041  | 0.991  | 0.918  | 0.818  | 0.701  |        |        |        |
| 6.0                                | 1.107  | 1.062  | 0.995  | 0.900  | 0.789  | 0.653  |        |        |
| 6.2                                | 1.173  | 1.134  | 1.072  | 0.982  | 0.877  | 0.745  |        |        |
| 6.4                                | 1.239  | 1.205  | 1.149  | 1.064  | 0.964  | 0.838  | 0.694  |        |
| 6.6                                | 1.305  | 1.277  | 1.226  | 1.146  | 1.052  | 0.931  | 0.792  |        |
| 6.8                                | 1.371  | 1.349  | 1.304  | 1.228  | 1.140  | 1.023  | 0.891  | 0.768  |
| 7.0                                | 1.437  | 1.420  | 1.381  | 1.311  | 1.227  | 1.116  | 0.989  | 0.871  |
| 7.2                                | 1.503  | 1.492  | 1.458  | 1.393  | 1.315  | 1.208  | 1.087  | 0.974  |
| 7.4                                | 1.570  | 1.564  | 1.535  | 1.475  | 1.402  | 1.301  | 1.185  | 1.077  |
| 7.6                                | 1.636  | 1.635  | 1.612  | 1.557  | 1.490  | 1.394  | 1.283  | 1.180  |
| 7.8                                | 1.702  | 1.707  | 1.689  | 1.639  | 1.578  | 1.486  | 1.381  | 1.283  |
| 8.0                                | 1.768  | 1.778  | 1.766  | 1.721  | 1.665  | 1.579  | 1.480  | 1.386  |
| 8.2                                | 1.834  | 1.850  | 1.844  | 1.803  | 1.753  | 1.671  | 1.578  | 1.489  |
| 8.4                                | 1.900  | 1.922  | 1.921  | 1.885  | 1.841  | 1.764  | 1.676  | 1.593  |
| 8.6                                | 1.966  | 1.993  | 1.998  | 1.967  | 1.928  | 1.857  | 1.774  | 1.696  |
| 8.8                                | 2.032  | 2.065  | 2.075  | 2.049  | 2.016  | 1.949  | 1.872  | 1.799  |
| 9.0                                | 2.098  | 2.136  | 2.152  | 2.132  | 2.104  | 2.042  | 1.970  | 1.902  |
| 9.2                                | 2.164  | 2.208  | 2.229  | 2.214  | 2.191  | 2.134  | 2.068  | 2.005  |
| 9.4                                | 2.230  | 2.280  | 2.307  | 2.296  | 2.279  | 2.227  | 2.167  | 2.108  |
| 9.6                                | 2.296  | 2.351  | 2.384  | 2.378  | 2.367  | 2.320  | 2.265  | 2.211  |
| 9.8                                | 2.362  | 2.423  | 2.461  | 2.460  | 2.454  | 2.412  | 2.363  | 2.314  |
| 10.0                               | 2.428  | 2.494  | 2.538  | 2.542  | 2.542  | 2.505  | 2.461  | 2.417  |
| 10.2                               | 2.494  | 2.566  | 2.615  | 2.624  | 2.630  | 2.597  | 2.559  | 2.520  |
| 10.4                               | 2.560  | 2.638  | 2.692  | 2.706  | 2.717  | 2.690  | 2.657  | 2.623  |
| 10.6                               | 2.626  | 2.709  | 2.770  | 2.788  | 2.805  | 2.783  | 2.755  | 2.726  |
| 10.8                               | 2.692  | 2.781  | 2.847  | 2.870  | 2.893  | 2.875  | 2.854  | 2.830  |
| 11.0                               | 2.758  | 2.852  | 2.924  | 2.953  | 2.980  | 2.968  | 2.952  | 2.933  |
| 11.2                               | 2.824  | 2.924  | 3.001  | 3.035  | 3.068  | 3.060  | 3.050  | 3.036  |
| 11.4                               | 2.891  | 2.996  | 3.078  | 3.117  | 3.156  | 3.153  | 3.148  | 3.139  |
| For each additional 0.2 ft. depth: |        |        |        |        |        |        |        |        |
|                                    | +0.066 | +0.072 | +0.077 | +0.082 | +0.088 | +0.093 | +0.098 | +0.103 |

**VOLUME OF TRENCH BACKFILL (CU. YDS)  
PER LINEAL FOOT OF ELLIPTICAL STORM SEWER PIPE**

|                                    |        |        |        |        |        |        |        |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Eq. Round Size, in.                | 96     | 102    | 108    | 114    | 120    | 132    | 144    |
| Rise, in.                          | 77     | 82     | 87     | 92     | 97     | 106    | 116    |
| Span, in.                          | 121    | 128    | 136    | 143    | 151    | 166    | 180    |
| Wall Thickness, in.                | 9.50   | 9.75   | 10.00  | 10.50  | 11.00  | 12.00  | 13.00  |
| Pipe End Area, sq. ft.             | 73.30  | 81.66  | 91.04  | 101.08 | 112.28 | 134.72 | 159.55 |
| 7.2                                | 0.811  |        |        |        |        |        |        |
| 7.4                                | 0.919  |        |        |        |        |        |        |
| 7.6                                | 1.028  |        |        |        |        |        |        |
| 7.8                                | 1.137  | 0.970  |        |        |        |        |        |
| 8.0                                | 1.245  | 1.084  |        |        |        |        |        |
| 8.2                                | 1.354  | 1.197  | 1.025  |        |        |        |        |
| 8.4                                | 1.463  | 1.310  | 1.144  |        |        |        |        |
| 8.6                                | 1.517  | 1.423  | 1.262  | 1.071  |        |        |        |
| 8.8                                | 1.680  | 1.537  | 1.381  | 1.194  |        |        |        |
| 9.0                                | 1.789  | 1.650  | 1.499  | 1.318  | 1.119  |        |        |
| 9.2                                | 1.897  | 1.763  | 1.618  | 1.441  | 1.248  |        |        |
| 9.4                                | 2.006  | 1.877  | 1.736  | 1.564  | 1.377  |        |        |
| 9.6                                | 2.115  | 1.990  | 1.855  | 1.688  | 1.506  |        |        |
| 9.8                                | 2.223  | 2.103  | 1.973  | 1.811  | 1.635  |        |        |
| 10.0                               | 2.332  | 2.216  | 2.092  | 1.935  | 1.764  | 1.400  |        |
| 10.2                               | 2.440  | 2.330  | 2.210  | 2.058  | 1.893  | 1.539  |        |
| 10.4                               | 2.549  | 2.443  | 2.329  | 2.182  | 2.022  | 1.679  |        |
| 10.6                               | 2.658  | 2.556  | 2.447  | 2.305  | 2.151  | 1.818  |        |
| 10.8                               | 2.766  | 2.669  | 2.566  | 2.429  | 2.280  | 1.958  | 1.502  |
| 11.0                               | 2.875  | 2.783  | 2.684  | 2.552  | 2.409  | 2.097  | 1.651  |
| 11.2                               | 2.984  | 2.896  | 2.803  | 2.676  | 2.538  | 2.237  | 1.801  |
| 11.4                               | 3.092  | 3.009  | 2.921  | 2.799  | 2.667  | 2.376  | 1.950  |
| 11.6                               | 3.201  | 3.123  | 3.040  | 2.922  | 2.796  | 2.516  | 2.100  |
| 11.8                               | 3.310  | 3.236  | 3.159  | 3.046  | 2.925  | 2.655  | 2.249  |
| 12.0                               | 3.418  | 3.349  | 3.277  | 3.169  | 3.054  | 2.795  | 2.398  |
| 12.2                               | 3.527  | 3.462  | 3.396  | 3.293  | 3.183  | 2.934  | 2.548  |
| 12.4                               | 3.636  | 3.576  | 3.514  | 3.416  | 3.312  | 3.074  | 2.697  |
| 12.6                               | 3.744  | 3.689  | 3.633  | 3.540  | 3.441  | 3.213  | 2.847  |
| 12.8                               | 3.853  | 3.802  | 3.751  | 3.663  | 3.570  | 3.353  | 2.996  |
| 13.0                               | 3.961  | 3.915  | 3.870  | 3.787  | 3.699  | 3.492  | 3.145  |
| 13.2                               | 4.070  | 4.029  | 3.988  | 3.910  | 3.828  | 3.632  | 3.295  |
| 13.4                               | 4.179  | 4.142  | 4.107  | 4.034  | 3.957  | 3.771  | 3.444  |
| 13.6                               | 4.267  | 4.255  | 4.225  | 4.157  | 4.086  | 3.911  | 3.593  |
| 13.8                               | 4.396  | 4.369  | 4.344  | 4.280  | 4.215  | 4.050  | 3.743  |
| 14.0                               | 4.505  | 4.482  | 4.462  | 4.404  | 4.344  | 4.190  | 3.892  |
| 14.2                               | 4.613  | 4.595  | 4.581  | 4.527  | 4.473  | 4.329  | 4.042  |
| 14.4                               | 4.722  | 4.708  | 4.699  | 4.651  | 4.602  | 4.469  | 4.191  |
| 14.6                               | 4.831  | 4.822  | 4.818  | 4.774  | 4.731  | 4.608  | 4.340  |
| 14.8                               | 4.939  | 4.935  | 4.936  | 4.898  | 4.860  | 4.748  | 4.490  |
| For each additional 0.2 ft. depth: |        |        |        |        |        |        |        |
|                                    | +0.109 | +0.113 | +0.119 | +0.123 | +0.129 | +0.140 | +0.149 |

## TRENCH BACKFILL FOR ARCH PIPE, ENGLISH



- W = Width of Trench (ft.)
- D = Depth from Subgrade to Pipe Invert (ft.)
- H = Height of Trench Backfill Limits (ft.) = (D – B)
- B = Distance from Pipe Invert to Springline (ft.) (See Table)
- L = Length of Trench (ft.)
- A = End Area of Pipe above Springline (Sq. ft.) (See Table)

$$\text{Volume (Cu. Yds.)} = [(H \times W) - A] \times L \times 1/27$$

This formula should be used by the designer or field engineer to determine the volume of TRENCH BACKFILL that should be paid for when backfilling storm sewer trenches utilizing reinforced concrete ARCH PIPE. Maximum trench widths permitted by Article 550.04 of the Standard Specifications are used.



| Equivalent Round Size (in.) | Rise (in.) | Span (in.) | Wall Thickness (in.) | End Area Above Springline (sq. ft.) | B (ft.) |
|-----------------------------|------------|------------|----------------------|-------------------------------------|---------|
| 15                          | 11.00      | 18.00      | 2.25                 | 1.08                                | 0.39    |
| 18                          | 13.50      | 22.00      | 2.50                 | 1.42                                | 0.50    |
| 21                          | 15.50      | 26.00      | 2.75                 | 1.94                                | 0.52    |
| 24                          | 18.00      | 28.50      | 3.00                 | 2.77                                | 0.49    |
| 27                          | 22.50      | 36.25      | 3.50                 | 4.20                                | 0.64    |
| 30                          | 22.50      | 36.25      | 3.50                 | 4.20                                | 0.64    |
| 36                          | 26.63      | 43.75      | 4.00                 | 6.04                                | 0.71    |
| 42                          | 31.31      | 51.13      | 4.50                 | 8.20                                | 0.84    |
| 48                          | 36.00      | 58.50      | 5.00                 | 10.67                               | 0.97    |
| 54                          | 40.00      | 65.00      | 5.50                 | 13.07                               | 1.08    |
| 60                          | 45.00      | 73.00      | 6.00                 | 16.34                               | 1.22    |
| 66                          | 54.00      | 88.00      | 7.00                 | 23.76                               | 1.42    |
| 72                          | 54.00      | 88.00      | 7.00                 | 23.76                               | 1.42    |
| 84                          | 62.00      | 102.00     | 8.00                 | 32.10                               | 1.55    |
| 90                          | 72.00      | 115.00     | 8.50                 | 39.65                               | 1.98    |
| 96                          | 77.25      | 122.00     | 9.00                 | 46.07                               | 2.03    |
| 108                         | 87.13      | 138.00     | 10.00                | 59.07                               | 2.24    |
| 120                         | 96.88      | 154.00     | 11.00                | 71.05                               | 2.61    |
| 132                         | 106.50     | 168.75     | 10.00                | 72.95                               | 3.79    |

EXAMPLE

Given: Pipe = 30" Round size eq., rise = 22.5", span = 36.25"

Average Depth, D = 4.7 feet

Trench Length = 82.3 feet

Width, W = 6.6 feet

Find: Cubic Yards of TRENCH BACKFILL

Solution: From Table, End Area, A = 4.20 sq. ft.

B = 0.64 ft.

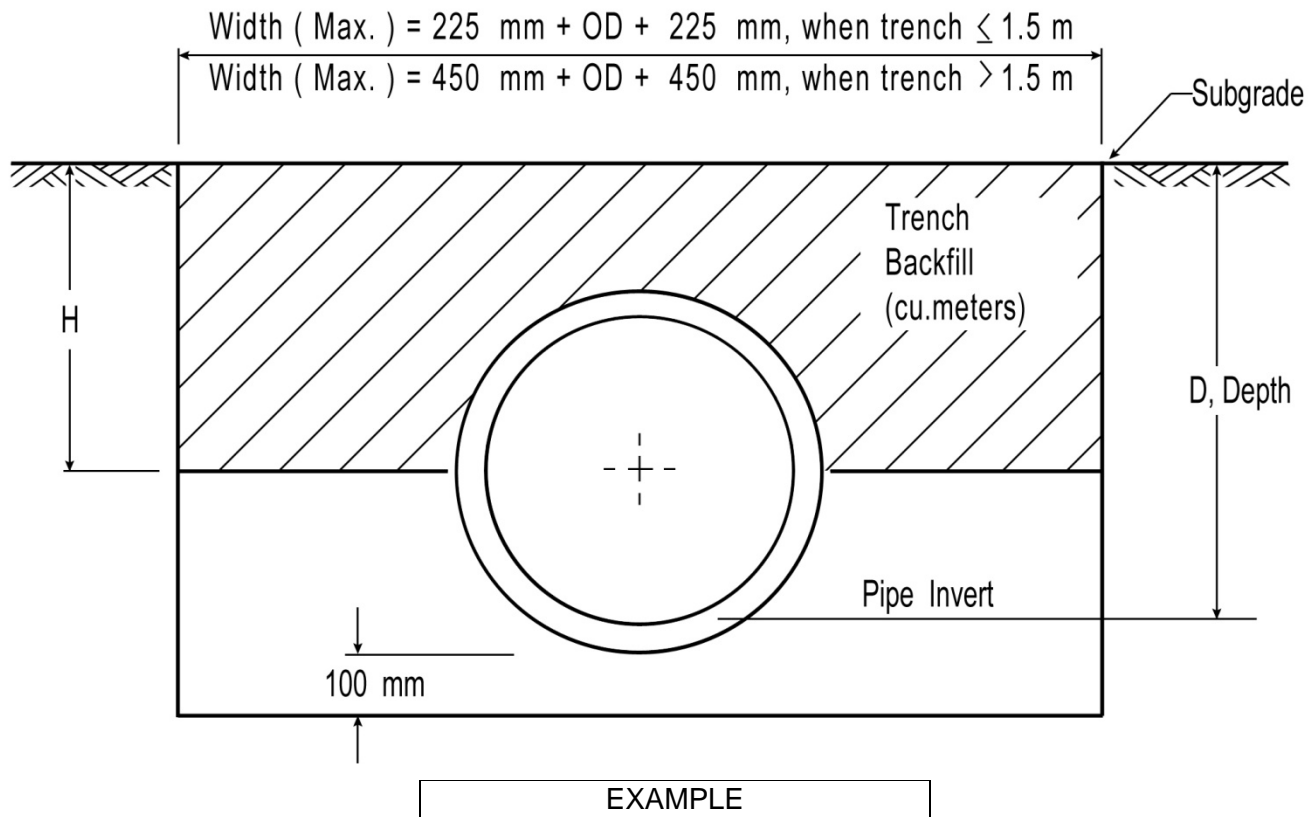
Pay Height, H = D – B = 4.70 – 0.64 = 4.06 ft

Volume = [(H x W) – A] x L x 1/27

= [(4.06) (6.6) – 4.20] (82.3) (1/27)

TRENCH BACKFILL = 68.9 cu. yds.

## TRENCH BACKFILL FOR CIRCULAR PIPES, METRIC



Given: Pipe = 1050 mm Storm Sewer  
 Average Depth, D = 2.10 m  
 Trench Length = 25.8 m

Find: Cubic Meters of TRENCH BACKFILL

Solution: From Table, cubic meters/linear meter      2.937 m<sup>2</sup>  
 x Trench length      x 25.8m  
 TRENCH BACKFILL VOLUME      = 75.8 m<sup>3</sup>

Note: If the field engineer measures a width of trench less than the maximum permitted, the values included herein will be of no value. The actual volume of TRENCH BACKFILL used will therefore have to be calculated using the following formula:

$$\text{Cubic Meters} = [(H \times W) - (\text{Pipe End Area})/2] \times L$$

# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF CIRCULAR STORM SEWER

Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

| Nominal Diameter (mm)                 | 200 (8") | 250 (10") | 300 (12") | 375 (15") | 450 (18") | 525 (21") |
|---------------------------------------|----------|-----------|-----------|-----------|-----------|-----------|
| Wall Thickness (mm)                   | 42       | 47        | 51        | 57        | 64        | 70        |
| End Area (sq meters)                  | 0.065    | 0.095     | 0.130     | 0.193     | 0.268     | 0.356     |
| 0.50                                  | 0.261    | 0.250     | 0.233     | 0.196     |           |           |
| 0.55                                  | 0.298    | 0.290     | 0.276     | 0.243     | 0.198     |           |
| 0.60                                  | 0.335    | 0.330     | 0.318     | 0.291     | 0.250     |           |
| 0.65                                  | 0.372    | 0.370     | 0.361     | 0.338     | 0.302     | 0.253     |
| 0.70                                  | 0.409    | 0.409     | 0.404     | 0.385     | 0.353     | 0.309     |
| 0.75                                  | 0.446    | 0.449     | 0.447     | 0.433     | 0.405     | 0.365     |
| 0.80                                  | 0.483    | 0.489     | 0.490     | 0.480     | 0.457     | 0.421     |
| 0.85                                  | 0.520    | 0.529     | 0.533     | 0.527     | 0.509     | 0.477     |
| 0.90                                  | 0.557    | 0.569     | 0.575     | 0.574     | 0.560     | 0.533     |
| 0.95                                  | 0.593    | 0.609     | 0.618     | 0.622     | 0.612     | 0.589     |
| 1.00                                  | 0.630    | 0.649     | 0.661     | 0.669     | 0.664     | 0.646     |
| 1.05                                  | 0.667    | 0.688     | 0.704     | 0.716     | 0.715     | 0.702     |
| 1.10                                  | 0.704    | 0.728     | 0.747     | 0.763     | 0.767     | 0.758     |
| 1.15                                  | 0.741    | 0.768     | 0.789     | 0.811     | 0.819     | 0.814     |
| 1.20                                  | 0.778    | 0.808     | 0.832     | 0.858     | 0.871     | 0.870     |
| 1.25                                  | 0.815    | 0.848     | 0.875     | 0.905     | 0.922     | 0.926     |
| 1.30                                  | 0.852    | 0.888     | 0.918     | 0.952     | 0.974     | 0.983     |
| 1.35                                  | 0.889    | 0.928     | 1.619     | 1.637     | 1.642     | 1.635     |
| 1.40                                  | 1.640    | 1.668     | 1.690     | 1.712     | 1.722     | 1.718     |
| 1.45                                  | 1.704    | 1.735     | 1.760     | 1.787     | 1.801     | 1.802     |
| 1.50                                  | 1.768    | 1.802     | 1.830     | 1.862     | 1.880     | 1.886     |
| 1.55                                  | 1.833    | 1.870     | 1.901     | 1.937     | 1.959     | 1.969     |
| 1.60                                  | 1.897    | 1.937     | 1.971     | 2.011     | 2.039     | 2.053     |
| 1.65                                  | 1.962    | 2.004     | 2.041     | 2.086     | 2.118     | 2.136     |
| 1.70                                  | 2.026    | 2.072     | 2.112     | 2.161     | 2.197     | 2.220     |
| 1.75                                  | 2.090    | 2.139     | 2.182     | 2.236     | 2.276     | 2.304     |
| 1.80                                  | 2.155    | 2.206     | 2.252     | 2.310     | 2.355     | 2.387     |
| 1.85                                  | 2.219    | 2.274     | 2.323     | 2.385     | 2.435     | 2.471     |
| 1.90                                  | 2.284    | 2.341     | 2.393     | 2.460     | 2.514     | 2.555     |
| 1.95                                  | 2.348    | 2.409     | 2.463     | 2.535     | 2.593     | 2.638     |
| 2.00                                  | 2.412    | 2.476     | 2.534     | 2.609     | 2.672     | 2.722     |
| 2.05                                  | 2.477    | 2.543     | 2.604     | 2.684     | 2.751     | 2.806     |
| 2.10                                  | 2.541    | 2.611     | 2.674     | 2.759     | 2.831     | 2.889     |
| 2.15                                  | 2.606    | 2.678     | 2.745     | 2.834     | 2.910     | 2.973     |
| 2.20                                  | 2.670    | 2.745     | 2.815     | 2.908     | 2.989     | 3.057     |
| 2.25                                  | 2.734    | 2.813     | 2.885     | 2.983     | 3.068     | 3.140     |
| 2.30                                  | 2.799    | 2.880     | 2.956     | 3.058     | 3.147     | 3.224     |
| 2.35                                  | 2.863    | 2.947     | 3.026     | 3.133     | 3.227     | 3.308     |
| 2.40                                  | 2.927    | 3.015     | 3.096     | 3.208     | 3.306     | 3.391     |
| 2.45                                  | 2.992    | 3.082     | 3.166     | 3.282     | 3.385     | 3.475     |
| 2.50                                  | 3.056    | 3.149     | 3.237     | 3.357     | 3.464     | 3.559     |
| 2.55                                  | 3.121    | 3.217     | 3.307     | 3.432     | 3.544     | 3.642     |
| 2.60                                  | 3.185    | 3.284     | 3.377     | 3.507     | 3.623     | 3.726     |
| 2.65                                  | 3.249    | 3.351     | 3.448     | 3.581     | 3.702     | 3.810     |
| 2.70                                  | 3.314    | 3.419     | 3.518     | 3.656     | 3.781     | 3.893     |
| 2.75                                  | 3.378    | 3.486     | 3.588     | 3.731     | 3.860     | 3.977     |
| 2.80                                  | 3.443    | 3.554     | 3.659     | 3.806     | 3.940     | 4.061     |
| 2.85                                  | 3.507    | 3.621     | 3.729     | 3.880     | 4.019     | 4.144     |
| 2.90                                  | 3.571    | 3.688     | 3.799     | 3.955     | 4.098     | 4.228     |
| 2.95                                  | 3.636    | 3.756     | 3.870     | 4.030     | 4.177     | 4.312     |
| 3.00                                  | 3.700    | 3.823     | 3.940     | 4.105     | 4.256     | 4.395     |
| For each additional 0.05 meter depth: |          |           |           |           |           |           |
|                                       | +0.064   | +0.067    | +0.070    | +0.075    | +0.079    | +0.084    |

# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF CIRCULAR STORM SEWER

Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

| Nominal Dia. (mm)                     | 600 (24") | 675 (27") | 750 (30") | 825 (33") | 900 (36") | 1050 (42") |
|---------------------------------------|-----------|-----------|-----------|-----------|-----------|------------|
| Wall Thickness (mm)                   | 76        | 83        | 89        | 95        | 102       | 114        |
| End Area (sq meters)                  | 0.456     | 0.569     | 0.694     | 0.831     | 0.981     | 1.318      |
| 0.70                                  | 0.251     |           |           |           |           |            |
| 0.75                                  | 0.312     |           |           |           |           |            |
| 0.80                                  | 0.372     | 0.310     |           |           |           |            |
| 0.85                                  | 0.433     | 0.375     |           |           |           |            |
| 0.90                                  | 0.493     | 0.440     | 0.374     |           |           |            |
| 0.95                                  | 0.554     | 0.505     | 0.444     | 0.369     |           |            |
| 1.00                                  | 0.615     | 0.570     | 0.513     | 0.443     |           |            |
| 1.05                                  | 0.675     | 0.636     | 0.583     | 0.517     | 0.439     |            |
| 1.10                                  | 0.736     | 0.701     | 0.652     | 0.591     | 0.517     |            |
| 1.15                                  | 0.796     | 0.766     | 0.722     | 0.665     | 0.596     |            |
| 1.20                                  | 0.857     | 0.831     | 0.791     | 0.739     | 0.674     | 0.505      |
| 1.25                                  | 0.918     | 0.896     | 0.861     | 0.813     | 0.752     | 0.592      |
| 1.30                                  | 0.978     | 0.961     | 0.930     | 0.887     | 1.294     | 1.101      |
| 1.35                                  | 1.614     | 1.580     | 1.533     | 1.473     | 1.400     | 1.215      |
| 1.40                                  | 1.702     | 1.672     | 1.630     | 1.574     | 1.506     | 1.330      |
| 1.45                                  | 1.790     | 1.765     | 1.727     | 1.676     | 1.612     | 1.445      |
| 1.50                                  | 1.878     | 1.857     | 1.824     | 1.777     | 1.718     | 1.560      |
| 1.55                                  | 1.966     | 1.950     | 1.921     | 1.879     | 1.824     | 1.675      |
| 1.60                                  | 2.054     | 2.042     | 2.018     | 1.980     | 1.930     | 1.789      |
| 1.65                                  | 2.142     | 2.135     | 2.115     | 2.082     | 2.035     | 1.904      |
| 1.70                                  | 2.230     | 2.228     | 2.212     | 2.183     | 2.141     | 2.019      |
| 1.75                                  | 2.318     | 2.320     | 2.309     | 2.284     | 2.247     | 2.134      |
| 1.80                                  | 2.407     | 2.413     | 2.406     | 2.386     | 2.353     | 2.248      |
| 1.85                                  | 2.495     | 2.505     | 2.503     | 2.487     | 2.459     | 2.363      |
| 1.90                                  | 2.583     | 2.598     | 2.600     | 2.589     | 2.565     | 2.478      |
| 1.95                                  | 2.671     | 2.690     | 2.697     | 2.690     | 2.671     | 2.593      |
| 2.00                                  | 2.759     | 2.783     | 2.794     | 2.792     | 2.777     | 2.707      |
| 2.05                                  | 2.847     | 2.875     | 2.891     | 2.893     | 2.882     | 2.822      |
| 2.10                                  | 2.935     | 2.968     | 2.988     | 2.994     | 2.988     | 2.937      |
| 2.15                                  | 3.023     | 3.060     | 3.085     | 3.096     | 3.094     | 3.052      |
| 2.20                                  | 3.111     | 3.153     | 3.182     | 3.197     | 3.200     | 3.167      |
| 2.25                                  | 3.199     | 3.246     | 3.279     | 3.299     | 3.306     | 3.281      |
| 2.30                                  | 3.288     | 3.338     | 3.376     | 3.400     | 3.412     | 3.396      |
| 2.35                                  | 3.376     | 3.431     | 3.473     | 3.502     | 3.518     | 3.511      |
| 2.40                                  | 3.464     | 3.523     | 3.570     | 3.603     | 3.624     | 3.626      |
| 2.45                                  | 3.552     | 3.616     | 3.667     | 3.705     | 3.729     | 3.740      |
| 2.50                                  | 3.640     | 3.708     | 3.764     | 3.806     | 3.835     | 3.855      |
| 2.55                                  | 3.728     | 3.801     | 3.861     | 3.907     | 3.941     | 3.970      |
| 2.60                                  | 3.816     | 3.893     | 3.958     | 4.009     | 4.047     | 4.085      |
| 2.65                                  | 3.904     | 3.986     | 4.055     | 4.110     | 4.153     | 4.199      |
| 2.70                                  | 3.992     | 4.078     | 4.152     | 4.212     | 4.259     | 4.314      |
| 2.75                                  | 4.080     | 4.171     | 4.249     | 4.313     | 4.365     | 4.429      |
| 2.80                                  | 4.169     | 4.264     | 4.346     | 4.415     | 4.471     | 4.544      |
| 2.85                                  | 4.257     | 4.356     | 4.443     | 4.516     | 4.577     | 4.659      |
| 2.90                                  | 4.345     | 4.449     | 4.540     | 4.617     | 4.682     | 4.773      |
| 2.95                                  | 4.433     | 4.541     | 4.637     | 4.719     | 4.788     | 4.888      |
| 3.00                                  | 4.521     | 4.634     | 4.733     | 4.820     | 4.894     | 5.003      |
| 3.05                                  | 4.609     | 4.726     | 4.830     | 4.922     | 5.000     | 5.118      |
| 3.10                                  | 4.697     | 4.819     | 4.927     | 5.023     | 5.106     | 5.232      |
| 3.15                                  | 4.785     | 4.911     | 5.024     | 5.125     | 5.212     | 5.347      |
| 3.20                                  | 4.873     | 5.004     | 5.121     | 5.226     | 5.318     | 5.462      |
| For each additional 0.05 meter depth: |           |           |           |           |           |            |
|                                       | +0.088    | +0.093    | +0.097    | +0.101    | +0.106    | +0.115     |

# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF CIRCULAR STORM SEWER

Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

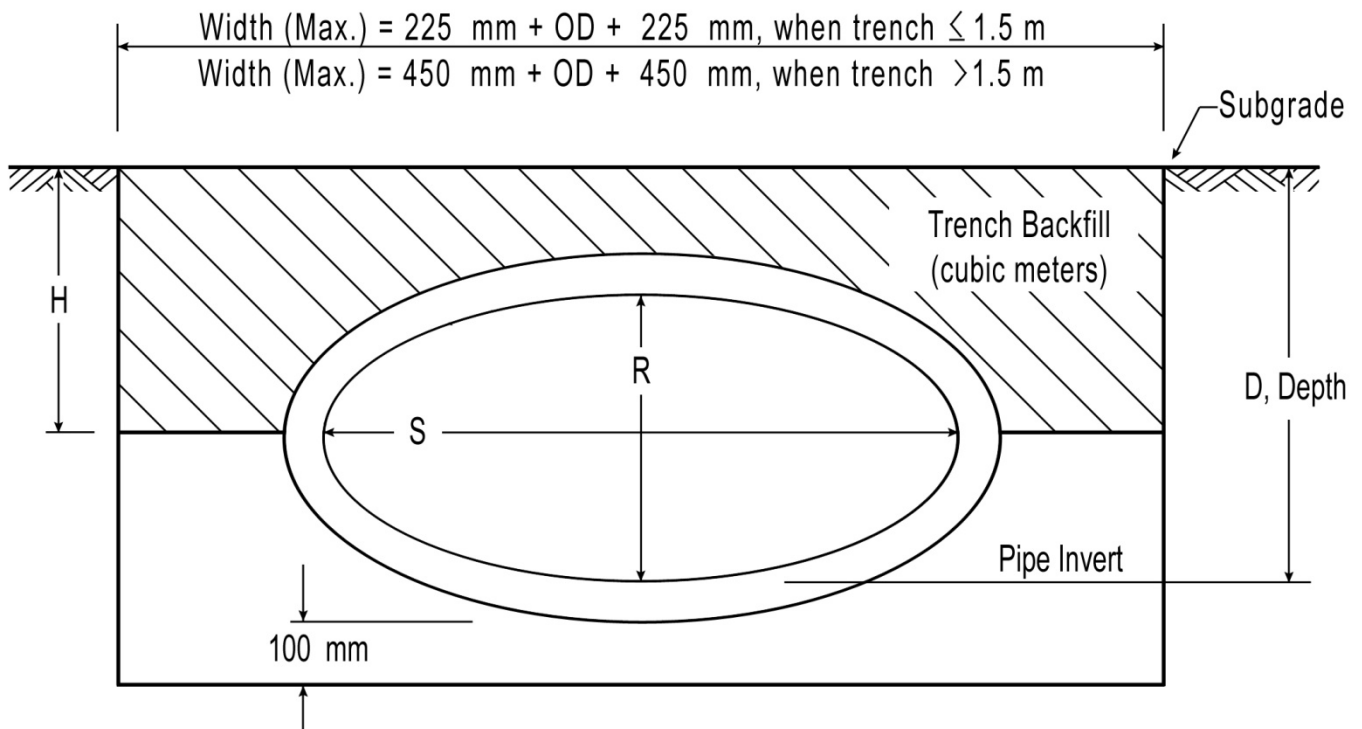
| Nominal Dia. (mm)<br>Wall Thickness (mm)<br>End Area (sq meters) | 1200 (48")<br>127<br>1.705 | 1350 (54")<br>140<br>2.141 | 1500 (60")<br>152<br>2.627 | 1650 (66")<br>165<br>3.162 | 1800 (72")<br>178<br>3.748 | 1950 (78")<br>191<br>4.383 |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 1.35   | 0.979                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.40   | 1.103                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.45   | 1.226                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.50   | 1.350                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.55   | 1.474                      | 1.221                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.60   | 1.597                      | 1.353                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.65   | 1.721                      | 1.486                      | 0.000                      | 0.000                      | 0.000                      | 0.000                      |
| 1.70   | 1.844                      | 1.618                      | 1.340                      | 0.000                      | 0.000                      | 0.000                      |
| 1.75   | 1.968                      | 1.751                      | 1.481                      | 0.000                      | 0.000                      | 0.000                      |
| 1.80   | 2.092                      | 1.883                      | 1.623                      | 0.000                      | 0.000                      | 0.000                      |
| 1.85   | 2.215                      | 2.016                      | 1.764                      | 1.461                      | 0.000                      | 0.000                      |
| 1.90   | 2.339                      | 2.148                      | 1.906                      | 1.611                      | 0.000                      | 0.000                      |
| 1.95   | 2.463                      | 2.281                      | 2.047                      | 1.762                      | 0.000                      | 0.000                      |
| 2.00   | 2.586                      | 2.414                      | 2.189                      | 1.912                      | 0.000                      | 0.000                      |
| 2.05   | 2.710                      | 2.546                      | 2.330                      | 2.062                      | 1.742                      | 0.000                      |
| 2.10   | 2.834                      | 2.679                      | 2.472                      | 2.213                      | 1.902                      | 0.000                      |
| 2.15   | 2.957                      | 2.811                      | 2.613                      | 2.363                      | 2.061                      | 0.000                      |
| 2.20   | 3.081                      | 2.944                      | 2.754                      | 2.513                      | 2.220                      | 1.875                      |
| 2.25   | 3.205                      | 3.076                      | 2.896                      | 2.664                      | 2.379                      | 2.043                      |
| 2.30   | 3.328                      | 3.209                      | 3.037                      | 2.814                      | 2.539                      | 2.211                      |
| 2.35   | 3.452                      | 3.341                      | 3.179                      | 2.964                      | 2.698                      | 2.379                      |
| 2.40   | 3.576                      | 3.474                      | 3.320                      | 3.115                      | 2.857                      | 2.547                      |
| 2.45   | 3.699                      | 3.606                      | 3.462                      | 3.265                      | 3.016                      | 2.716                      |
| 2.50   | 3.823                      | 3.739                      | 3.603                      | 3.415                      | 3.175                      | 2.884                      |
| 2.55   | 3.947                      | 3.872                      | 3.745                      | 3.566                      | 3.335                      | 3.052                      |
| 2.60   | 4.070                      | 4.004                      | 3.886                      | 3.716                      | 3.494                      | 3.220                      |
| 2.65   | 4.194                      | 4.137                      | 4.027                      | 3.866                      | 3.653                      | 3.388                      |
| 2.70   | 4.318                      | 4.269                      | 4.169                      | 4.017                      | 3.812                      | 3.556                      |
| 2.75   | 4.441                      | 4.402                      | 4.310                      | 4.167                      | 3.971                      | 3.724                      |
| 2.80   | 4.565                      | 4.534                      | 4.452                      | 4.317                      | 4.131                      | 3.892                      |
| 2.85   | 4.689                      | 4.667                      | 4.593                      | 4.467                      | 4.290                      | 4.060                      |
| 2.90   | 4.812                      | 4.799                      | 4.735                      | 4.618                      | 4.449                      | 4.229                      |
| 2.95   | 4.936                      | 4.932                      | 4.876                      | 4.768                      | 4.608                      | 4.397                      |
| 3.00   | 5.060                      | 5.065                      | 5.017                      | 4.918                      | 4.768                      | 4.565                      |
| 3.05   | 5.183                      | 5.197                      | 5.159                      | 5.069                      | 4.927                      | 4.733                      |
| 3.10   | 5.307                      | 5.330                      | 5.300                      | 5.219                      | 5.086                      | 4.901                      |
| 3.15   | 5.431                      | 5.462                      | 5.442                      | 5.369                      | 5.245                      | 5.069                      |
| 3.20   | 5.554                      | 5.595                      | 5.583                      | 5.520                      | 5.404                      | 5.237                      |
| 3.25   | 5.678                      | 5.727                      | 5.725                      | 5.670                      | 5.564                      | 5.405                      |
| 3.30   | 5.802                      | 5.860                      | 5.866                      | 5.820                      | 5.723                      | 5.573                      |
| 3.35   | 5.925                      | 5.992                      | 6.008                      | 5.971                      | 5.882                      | 5.742                      |
| 3.40   | 6.049                      | 6.125                      | 6.149                      | 6.121                      | 6.041                      | 5.910                      |
| 3.45   | 6.173                      | 6.257                      | 6.290                      | 6.271                      | 6.201                      | 6.078                      |
| 3.50   | 6.296                      | 6.390                      | 6.432                      | 6.422                      | 6.360                      | 6.246                      |
| 3.55   | 6.420                      | 6.523                      | 6.573                      | 6.572                      | 6.519                      | 6.414                      |
| 3.60   | 6.544                      | 6.655                      | 6.715                      | 6.722                      | 6.678                      | 6.582                      |
| 3.65   | 6.667                      | 6.788                      | 6.856                      | 6.873                      | 6.837                      | 6.750                      |
| 3.70   | 6.791                      | 6.920                      | 6.998                      | 7.023                      | 6.997                      | 6.918                      |
| 3.75   | 6.915                      | 7.053                      | 7.139                      | 7.173                      | 7.156                      | 7.086                      |
| 3.80   | 7.038                      | 7.185                      | 7.281                      | 7.324                      | 7.315                      | 7.255                      |
| 3.85   | 7.162                      | 7.318                      | 7.422                      | 7.474                      | 7.474                      | 7.423                      |
| For each additional 0.05 meter depth:                            |                            |                            |                            |                            |                            |                            |
|  | +0.124                     | +0.133                     | +0.141                     | +0.150                     | +0.159                     | +0.168                     |

# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF CIRCULAR STORM SEWER

Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

| Nominal Dia. (mm)                     | 2100 (84") | 2250 (90") | 2400 (96") | 2550 (102") | 2700 (108") |
|---------------------------------------|------------|------------|------------|-------------|-------------|
| Wall Thickness (mm)                   | 203        | 216        | 229        | 241         | 254         |
| End Area (sq meters)                  | 5.067      | 5.801      | 6.585      | 7.419       | 8.302       |
| 2.35                                  | 2.009      |            |            |             |             |
| 2.40                                  | 2.186      |            |            |             |             |
| 2.45                                  | 2.363      |            |            |             |             |
| 2.50                                  | 2.540      |            |            |             |             |
| 2.55                                  | 2.717      | 2.330      |            |             |             |
| 2.60                                  | 2.894      | 2.516      |            |             |             |
| 2.65                                  | 3.071      | 2.702      |            |             |             |
| 2.70                                  | 3.248      | 2.888      | 2.476      |             |             |
| 2.75                                  | 3.425      | 3.074      | 2.671      |             |             |
| 2.80                                  | 3.602      | 3.260      | 2.866      |             |             |
| 2.85                                  | 3.779      | 3.446      | 3.060      | 2.623       |             |
| 2.90                                  | 3.956      | 3.632      | 3.255      | 2.827       |             |
| 2.95                                  | 4.133      | 3.817      | 3.450      | 3.030       |             |
| 3.00                                  | 4.310      | 4.003      | 3.645      | 3.234       | 2.772       |
| 3.05                                  | 4.487      | 4.189      | 3.839      | 3.438       | 2.984       |
| 3.10                                  | 4.664      | 4.375      | 4.034      | 3.642       | 3.197       |
| 3.15                                  | 4.841      | 4.561      | 4.229      | 3.845       | 3.409       |
| 3.20                                  | 5.018      | 4.747      | 4.424      | 4.049       | 3.622       |
| 3.25                                  | 5.195      | 4.933      | 4.619      | 4.253       | 3.835       |
| 3.30                                  | 5.372      | 5.119      | 4.813      | 4.456       | 4.047       |
| 3.35                                  | 5.549      | 5.305      | 5.008      | 4.660       | 4.260       |
| 3.40                                  | 5.726      | 5.490      | 5.203      | 4.864       | 4.472       |
| 3.45                                  | 5.903      | 5.676      | 5.398      | 5.067       | 4.685       |
| 3.50                                  | 6.080      | 5.862      | 5.592      | 5.271       | 4.897       |
| 3.55                                  | 6.257      | 6.048      | 5.787      | 5.475       | 5.110       |
| 3.60                                  | 6.434      | 6.234      | 5.982      | 5.678       | 5.322       |
| 3.65                                  | 6.611      | 6.420      | 6.177      | 5.882       | 5.535       |
| 3.70                                  | 6.788      | 6.606      | 6.372      | 6.086       | 5.748       |
| 3.75                                  | 6.965      | 6.792      | 6.566      | 6.289       | 5.960       |
| 3.80                                  | 7.142      | 6.978      | 6.761      | 6.493       | 6.173       |
| 3.85                                  | 7.319      | 7.163      | 6.956      | 6.697       | 6.385       |
| 3.90                                  | 7.496      | 7.349      | 7.151      | 6.900       | 6.598       |
| 3.95                                  | 7.673      | 7.535      | 7.346      | 7.104       | 6.810       |
| 4.00                                  | 7.850      | 7.721      | 7.540      | 7.308       | 7.023       |
| 4.05                                  | 8.027      | 7.907      | 7.735      | 7.511       | 7.235       |
| 4.10                                  | 8.204      | 8.093      | 7.930      | 7.715       | 7.448       |
| 4.15                                  | 8.381      | 8.279      | 8.125      | 7.919       | 7.661       |
| 4.20                                  | 8.558      | 8.465      | 8.319      | 8.122       | 7.873       |
| 4.25                                  | 8.735      | 8.651      | 8.514      | 8.326       | 8.086       |
| 4.30                                  | 8.912      | 8.836      | 8.709      | 8.530       | 8.298       |
| 4.35                                  | 9.089      | 9.022      | 8.904      | 8.733       | 8.511       |
| 4.40                                  | 9.266      | 9.208      | 9.099      | 8.937       | 8.723       |
| 4.45                                  | 9.443      | 9.394      | 9.293      | 9.141       | 8.936       |
| 4.50                                  | 9.620      | 9.580      | 9.488      | 9.344       | 9.149       |
| 4.55                                  | 9.797      | 9.766      | 9.683      | 9.548       | 9.361       |
| 4.60                                  | 9.974      | 9.952      | 9.878      | 9.752       | 9.574       |
| 4.65                                  | 10.151     | 10.138     | 10.072     | 9.955       | 9.786       |
| 4.70                                  | 10.328     | 10.324     | 10.267     | 10.159      | 9.999       |
| 4.75                                  | 10.505     | 10.509     | 10.462     | 10.363      | 10.211      |
| 4.80                                  | 10.682     | 10.695     | 10.657     | 10.566      | 10.424      |
| 4.85                                  | 10.859     | 10.881     | 10.852     | 10.770      | 10.636      |
| For each additional 0.05 meter depth: |            |            |            |             |             |
|                                       | +0.177     | +0.186     | +0.195     | +0.204      | +0.213      |

## TRENCH BACKFILL TABLE FOR ELLIPTICAL PIPE, METRIC



### EXAMPLE

Given: Pipe = 950 mm rise x 1500 mm span, Storm Sewer

Average Depth, D = 1.40m

Trench Length = 25.1m

Find: Cubic Meters of TRENCH BACKFILL

Solution: From Table, cubic meters/linear meter      1.690

x Trench length      x 25.1

TRENCH BACKFILL VOLUME      = **42.4 m<sup>3</sup>**

Note: If the Field Engineer measures a width of trench less than the maximum permitted, the values included herein will be of no value. The actual volume of TRENCH BACKFILL used will therefore have to be calculated using the following formula:

$$\text{Cubic Meters} = [(H \times W) - (\text{Pipe End Area})/2] \times L$$

# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF ELLIPTICAL STORM SEWER PIPE

Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

| Eq. Round Size (mm)                   | 450 (18") | 600 (24") | 675 (27") | 750 (30") | 825 (33")  | 900 (36")  | 975 (39")  | 1050 (42") |
|---------------------------------------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Nominal Rise (mm)                     | 350 (14") | 475 (19") | 550 (22") | 600 (24") | 675 (27")  | 725 (29")  | 800 (32")  | 850 (34")  |
| Nominal Span (mm)                     | 575 (23") | 750 (30") | 850 (34") | 950 (38") | 1050 (42") | 1125 (45") | 1225 (49") | 1325 (53") |
| Wall Thickness (mm)                   | 70        | 83        | 89        | 95        | 95         | 114        | 121        | 127        |
| End Area (sq meters)                  | 0.28      | 0.47      | 0.60      | 0.73      | 0.87       | 1.04       | 1.23       | 1.40       |
| 0.50                                  | 0.237     |           |           |           |            |            |            |            |
| 0.55                                  | 0.296     |           |           |           |            |            |            |            |
| 0.60                                  | 0.355     | 0.258     |           |           |            |            |            |            |
| 0.65                                  | 0.414     | 0.327     | 0.251     |           |            |            |            |            |
| 0.70                                  | 0.472     | 0.396     | 0.326     |           |            |            |            |            |
| 0.75                                  | 0.531     | 0.465     | 0.401     | 0.352     |            |            |            |            |
| 0.80                                  | 0.590     | 0.534     | 0.475     | 0.432     | 0.348      |            |            |            |
| 0.85                                  | 0.648     | 0.602     | 0.550     | 0.512     | 0.433      |            |            |            |
| 0.90                                  | 0.707     | 0.671     | 0.624     | 0.593     | 0.518      | 0.449      |            |            |
| 0.95                                  | 0.766     | 0.740     | 0.699     | 0.673     | 0.604      | 0.540      | 0.437      |            |
| 1.00                                  | 0.824     | 0.809     | 0.773     | 0.753     | 0.689      | 0.631      | 0.534      | 0.463      |
| 1.05                                  | 0.883     | 0.878     | 0.848     | 0.833     | 0.775      | 0.722      | 0.631      | 0.565      |
| 1.10                                  | 0.942     | 0.947     | 0.923     | 0.914     | 0.860      | 0.813      | 0.728      | 0.668      |
| 1.15                                  | 1.000     | 1.016     | 0.997     | 0.994     | 0.945      | 0.904      | 0.824      | 0.770      |
| 1.20                                  | 1.059     | 1.084     | 1.072     | 1.074     | 1.031      | 0.995      | 0.921      | 0.873      |
| 1.25                                  | 1.118     | 1.153     | 1.146     | 1.155     | 1.116      | 1.086      | 1.018      | 0.975      |
| 1.30                                  | 1.177     | 1.222     | 1.221     | 1.235     | 1.201      | 1.690      | 1.606      | 1.555      |
| 1.35                                  | 1.880     | 1.901     | 1.884     | 1.890     | 1.841      | 1.808      | 1.731      | 1.685      |
| 1.40                                  | 1.966     | 1.997     | 1.986     | 1.998     | 1.954      | 1.927      | 1.855      | 1.815      |
| 1.45                                  | 2.052     | 2.093     | 2.088     | 2.106     | 2.066      | 2.045      | 1.979      | 1.945      |
| 1.50                                  | 2.139     | 2.190     | 2.190     | 2.213     | 2.179      | 2.164      | 2.104      | 2.075      |
| 1.55                                  | 2.225     | 2.286     | 2.293     | 2.321     | 2.292      | 2.283      | 2.228      | 2.205      |
| 1.60                                  | 2.311     | 2.383     | 2.395     | 2.429     | 2.405      | 2.401      | 2.352      | 2.335      |
| 1.65                                  | 2.397     | 2.479     | 2.497     | 2.537     | 2.518      | 2.520      | 2.476      | 2.465      |
| 1.70                                  | 2.483     | 2.575     | 2.599     | 2.645     | 2.631      | 2.638      | 2.601      | 2.595      |
| 1.75                                  | 2.570     | 2.672     | 2.701     | 2.752     | 2.744      | 2.757      | 2.725      | 2.725      |
| 1.80                                  | 2.656     | 2.768     | 2.803     | 2.860     | 2.856      | 2.876      | 2.849      | 2.855      |
| 1.85                                  | 2.742     | 2.864     | 2.905     | 2.968     | 2.969      | 2.994      | 2.974      | 2.985      |
| 1.90                                  | 2.828     | 2.961     | 3.007     | 3.076     | 3.082      | 3.113      | 3.098      | 3.115      |
| 1.95                                  | 2.914     | 3.057     | 3.109     | 3.183     | 3.195      | 3.231      | 3.222      | 3.245      |
| 2.00                                  | 3.000     | 3.153     | 3.211     | 3.291     | 3.308      | 3.350      | 3.346      | 3.375      |
| 2.05                                  | 3.087     | 3.250     | 3.313     | 3.399     | 3.421      | 3.468      | 3.471      | 3.505      |
| 2.10                                  | 3.173     | 3.346     | 3.415     | 3.507     | 3.534      | 3.587      | 3.595      | 3.635      |
| 2.15                                  | 3.259     | 3.442     | 3.517     | 3.615     | 3.647      | 3.706      | 3.719      | 3.765      |
| 2.20                                  | 3.345     | 3.539     | 3.619     | 3.722     | 3.759      | 3.824      | 3.844      | 3.895      |
| 2.25                                  | 3.431     | 3.635     | 3.722     | 3.830     | 3.872      | 3.943      | 3.968      | 4.025      |
| 2.30                                  | 3.518     | 3.732     | 3.824     | 3.938     | 3.985      | 4.061      | 4.092      | 4.155      |
| 2.35                                  | 3.604     | 3.828     | 3.926     | 4.046     | 4.098      | 4.180      | 4.217      | 4.285      |
| 2.40                                  | 3.690     | 3.924     | 4.028     | 4.154     | 4.211      | 4.298      | 4.341      | 4.415      |
| 2.45                                  | 3.776     | 4.021     | 4.130     | 4.261     | 4.324      | 4.417      | 4.465      | 4.545      |
| 2.50                                  | 3.862     | 4.117     | 4.232     | 4.369     | 4.437      | 4.536      | 4.589      | 4.675      |
| 2.55                                  | 3.949     | 4.213     | 4.334     | 4.477     | 4.549      | 4.654      | 4.714      | 4.805      |
| 2.60                                  | 4.035     | 4.310     | 4.436     | 4.585     | 4.662      | 4.773      | 4.838      | 4.935      |
| 2.65                                  | 4.121     | 4.406     | 4.538     | 4.692     | 4.775      | 4.891      | 4.962      | 5.065      |
| 2.70                                  | 4.207     | 4.502     | 4.640     | 4.800     | 4.888      | 5.010      | 5.087      | 5.195      |
| 2.75                                  | 4.293     | 4.599     | 4.742     | 4.908     | 5.001      | 5.129      | 5.211      | 5.325      |
| 2.80                                  | 4.380     | 4.695     | 4.844     | 5.016     | 5.114      | 5.247      | 5.335      | 5.455      |
| 2.85                                  | 4.466     | 4.791     | 4.946     | 5.124     | 5.227      | 5.366      | 5.459      | 5.586      |
| 2.90                                  | 4.552     | 4.888     | 5.048     | 5.231     | 5.339      | 5.484      | 5.584      | 5.716      |
| 2.95                                  | 4.638     | 4.984     | 5.151     | 5.339     | 5.452      | 5.603      | 5.708      | 5.846      |
| 3.00                                  | 4.724     | 5.080     | 5.253     | 5.447     | 5.565      | 5.721      | 5.832      | 5.976      |
| For each additional 0.05 meter depth: |           |           |           |           |            |            |            |            |
|                                       | +0.086    | +0.096    | +0.102    | +0.108    | +0.113     | +0.119     | +0.124     | +0.130     |



# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF ELLIPTICAL STORM SEWER PIPE

Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

| Eq. Round Size (mm)  | 1200 (48") | 1350 (54") | 1500 (60") | 1650 (66") | 1800 (72") | 1950 (78") | 2100 (84")  | 2250 (90")  |
|----------------------|------------|------------|------------|------------|------------|------------|-------------|-------------|
| Nominal Rise (mm)    | 950 (38")  | 1075 (43") | 1200 (48") | 1325 (53") | 1450 (58") | 1575 (63") | 1700 (68")  | 1800 (72")  |
| Nominal Span (mm)    | 1500 (60") | 1700 (68") | 1900 (76") | 2075 (83") | 2275 (91") | 2450 (98") | 2650 (106") | 2825 (113") |
| Wall Thickness (mm)  | 140        | 152        | 165        | 178        | 191        | 203        | 216         | 229         |
| End Area (sq meters) | 1.76       | 2.23       | 2.75       | 3.29       | 3.92       | 4.56       | 5.30        | 5.97        |
| 1.15                 | 0.623      |            |            |            |            |            |             |             |
| 1.20                 | 0.735      |            |            |            |            |            |             |             |
| 1.25                 | 0.848      | 1.019      |            |            |            |            |             |             |
| 1.30                 | 1.410      | 1.171      |            |            |            |            |             |             |
| 1.35                 | 1.550      | 1.323      |            |            |            |            |             |             |
| 1.40                 | 1.690      | 1.474      | 1.202      |            |            |            |             |             |
| 1.45                 | 1.831      | 1.626      | 1.365      |            |            |            |             |             |
| 1.50                 | 1.971      | 1.777      | 1.528      |            |            |            |             |             |
| 1.55                 | 2.111      | 1.929      | 1.691      | 1.391      |            |            |             |             |
| 1.60                 | 2.251      | 2.081      | 1.854      | 1.564      |            |            |             |             |
| 1.65                 | 2.391      | 2.232      | 2.017      | 1.737      |            |            |             |             |
| 1.70                 | 2.531      | 2.384      | 2.180      | 1.910      | 1.597      |            |             |             |
| 1.75                 | 2.672      | 2.535      | 2.343      | 2.084      | 1.781      |            |             |             |
| 1.80                 | 2.812      | 2.687      | 2.506      | 2.257      | 1.966      |            |             |             |
| 1.85                 | 2.952      | 2.839      | 2.669      | 2.430      | 2.151      | 1.808      |             |             |
| 1.90                 | 3.092      | 2.990      | 2.832      | 2.603      | 2.335      | 2.003      |             |             |
| 1.95                 | 3.232      | 3.142      | 2.995      | 2.776      | 2.520      | 2.198      | 1.832       |             |
| 2.00                 | 3.372      | 3.293      | 3.158      | 2.950      | 2.705      | 2.393      | 2.038       |             |
| 2.05                 | 3.513      | 3.445      | 3.321      | 3.123      | 2.889      | 2.587      | 2.244       |             |
| 2.10                 | 3.653      | 3.597      | 3.484      | 3.296      | 3.074      | 2.782      | 2.450       | 2.144       |
| 2.15                 | 3.793      | 3.748      | 3.647      | 3.469      | 3.258      | 2.977      | 2.657       | 2.360       |
| 2.20                 | 3.933      | 3.900      | 3.810      | 3.642      | 3.443      | 3.172      | 2.863       | 2.576       |
| 2.25                 | 4.073      | 4.051      | 3.973      | 3.816      | 3.628      | 3.367      | 3.069       | 2.793       |
| 2.30                 | 4.213      | 4.203      | 4.136      | 3.989      | 3.812      | 3.561      | 3.275       | 3.009       |
| 2.35                 | 4.354      | 4.355      | 4.299      | 4.162      | 3.997      | 3.756      | 3.481       | 3.225       |
| 2.40                 | 4.494      | 4.506      | 4.462      | 4.335      | 4.181      | 3.951      | 3.688       | 3.442       |
| 2.45                 | 4.634      | 4.658      | 4.625      | 4.508      | 4.366      | 4.146      | 3.894       | 3.658       |
| 2.50                 | 4.774      | 4.809      | 4.788      | 4.681      | 4.551      | 4.340      | 4.100       | 3.874       |
| 2.55                 | 4.914      | 4.961      | 4.951      | 4.855      | 4.735      | 4.535      | 4.306       | 4.091       |
| 2.60                 | 5.055      | 5.113      | 5.114      | 5.028      | 4.920      | 4.730      | 4.512       | 4.307       |
| 2.65                 | 5.195      | 5.264      | 5.277      | 5.201      | 5.105      | 4.925      | 4.719       | 4.524       |
| 2.70                 | 5.335      | 5.416      | 5.441      | 5.374      | 5.289      | 5.120      | 4.925       | 4.740       |
| 2.75                 | 5.475      | 5.567      | 5.604      | 5.547      | 5.474      | 5.314      | 5.131       | 4.956       |
| 2.80                 | 5.615      | 5.719      | 5.767      | 5.721      | 5.658      | 5.509      | 5.337       | 5.173       |
| 2.85                 | 5.755      | 5.871      | 5.930      | 5.894      | 5.843      | 5.704      | 5.543       | 5.389       |
| 2.90                 | 5.896      | 6.022      | 6.093      | 6.067      | 6.028      | 5.899      | 5.750       | 5.605       |
| 2.95                 | 6.036      | 6.174      | 6.256      | 6.240      | 6.212      | 6.093      | 5.956       | 5.822       |
| 3.00                 | 6.176      | 6.325      | 6.419      | 6.413      | 6.397      | 6.288      | 6.162       | 6.038       |
| 3.05                 | 6.316      | 6.477      | 6.582      | 6.587      | 6.582      | 6.483      | 6.368       | 6.255       |
| 3.10                 | 6.456      | 6.629      | 6.745      | 6.760      | 6.766      | 6.678      | 6.575       | 6.471       |
| 3.15                 | 6.596      | 6.780      | 6.908      | 6.933      | 6.951      | 6.873      | 6.781       | 6.687       |
| 3.20                 | 6.737      | 6.932      | 7.071      | 7.106      | 7.135      | 7.067      | 6.987       | 6.904       |
| 3.25                 | 6.877      | 7.083      | 7.234      | 7.279      | 7.320      | 7.262      | 7.193       | 7.120       |
| 3.30                 | 7.017      | 7.235      | 7.397      | 7.453      | 7.505      | 7.457      | 7.399       | 7.336       |
| 3.35                 | 7.157      | 7.387      | 7.560      | 7.626      | 7.689      | 7.652      | 7.606       | 7.553       |
| 3.40                 | 7.297      | 7.538      | 7.723      | 7.799      | 7.874      | 7.846      | 7.812       | 7.769       |
| 3.45                 | 7.437      | 7.690      | 7.886      | 7.972      | 8.059      | 8.041      | 8.018       | 7.986       |
| 3.50                 | 7.578      | 7.841      | 8.049      | 8.145      | 8.243      | 8.236      | 8.224       | 8.202       |
| 3.55                 | 7.718      | 7.993      | 8.212      | 8.318      | 8.428      | 8.431      | 8.430       | 8.418       |
| 3.60                 | 7.858      | 8.145      | 8.375      | 8.492      | 8.612      | 8.626      | 8.637       | 8.635       |
| 3.65                 | 7.998      | 8.296      | 8.538      | 8.665      | 8.797      | 8.820      | 8.843       | 8.851       |

For each additional 0.05 meter depth:

|        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
| +0.140 | +0.152 | +0.163 | +0.173 | +0.185 | +0.195 | +0.206 | +0.216 |
|--------|--------|--------|--------|--------|--------|--------|--------|

# VOLUME OF TRENCH BACKFILL (CU. METERS) PER LINEAL METER OF ELLIPTICAL STORM SEWER PIPE

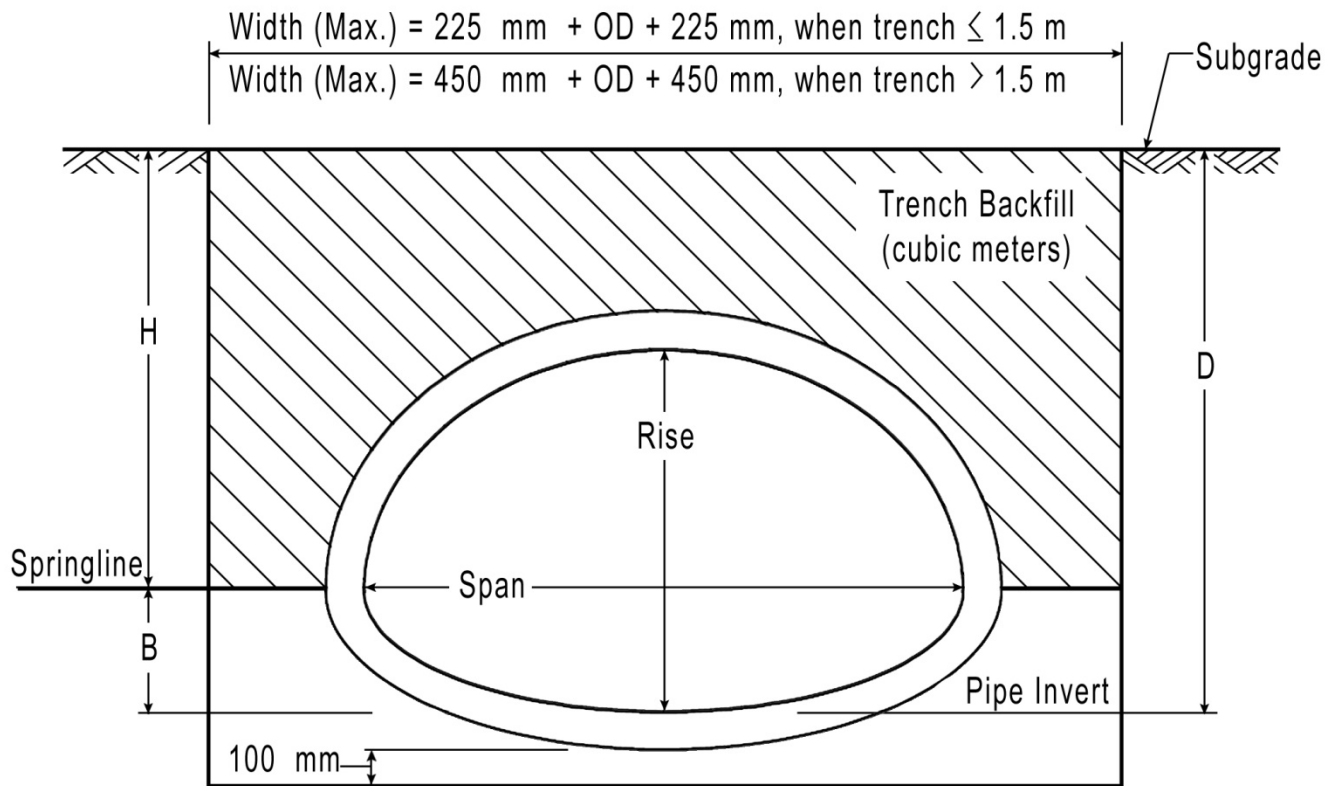
Note: The calculated volumes are based on the use of standard English sized pipes that meet the tolerances of the Metric pay items.

| Eq. Round Size (mm)  | 2400 (96")  | 2550 (102") | 2700 (108") | 2850 (114") | 3000 (120") | 3300 (132") | 3600 (144") |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Nominal Rise (mm)    | 1925 (77")  | 2050 (82")  | 2175 (87")  | 2300 (92")  | 2425 (97")  | 2650 (106") | 2900 (116") |
| Nominal Span (mm)    | 3025 (121") | 3200 (128") | 3400 (136") | 3575 (143") | 3775 (151") | 4150 (166") | 4500 (180") |
| Wall Thickness (mm)  | 241         | 248         | 254         | 267         | 279         | 305         | 330         |
| End Area (sq meters) | 6.81        | 7.59        | 8.46        | 9.39        | 10.43       | 12.52       | 14.82       |
| 2.20                 | 2.163       |             |             |             |             |             |             |
| 2.25                 | 2.391       |             |             |             |             |             |             |
| 2.30                 | 2.618       |             |             |             |             |             |             |
| 2.35                 | 2.846       | 2.418       |             |             |             |             |             |
| 2.40                 | 3.074       | 2.656       |             |             |             |             |             |
| 2.45                 | 3.302       | 2.893       |             |             |             |             |             |
| 2.50                 | 3.530       | 3.130       | 2.694       |             |             |             |             |
| 2.55                 | 3.757       | 3.368       | 2.942       |             |             |             |             |
| 2.60                 | 3.985       | 3.605       | 3.190       |             |             |             |             |
| 2.65                 | 4.213       | 3.842       | 3.438       | 2.958       |             |             |             |
| 2.70                 | 4.441       | 4.080       | 3.687       | 3.216       |             |             |             |
| 2.75                 | 4.669       | 4.317       | 3.935       | 3.475       | 2.973       |             |             |
| 2.80                 | 4.896       | 4.554       | 4.183       | 3.733       | 3.243       |             |             |
| 2.85                 | 5.124       | 4.791       | 4.431       | 3.991       | 3.513       |             |             |
| 2.90                 | 5.352       | 5.029       | 4.679       | 4.250       | 3.782       |             |             |
| 2.95                 | 5.580       | 5.266       | 4.927       | 4.508       | 4.052       |             |             |
| 3.00                 | 5.808       | 5.503       | 5.175       | 4.766       | 4.322       | 3.377       |             |
| 3.05                 | 6.035       | 5.741       | 5.423       | 5.024       | 4.591       | 3.669       |             |
| 3.10                 | 6.263       | 5.978       | 5.672       | 5.283       | 4.861       | 3.960       |             |
| 3.15                 | 6.491       | 6.215       | 5.920       | 5.541       | 5.131       | 4.251       |             |
| 3.20                 | 6.719       | 6.453       | 6.168       | 5.799       | 5.401       | 4.542       |             |
| 3.25                 | 6.947       | 6.690       | 6.416       | 6.058       | 5.670       | 4.834       |             |
| 3.30                 | 7.174       | 6.927       | 6.664       | 6.316       | 5.940       | 5.125       | 3.974       |
| 3.35                 | 7.402       | 7.165       | 6.912       | 6.574       | 6.210       | 5.416       | 4.286       |
| 3.40                 | 7.630       | 7.402       | 7.160       | 6.832       | 6.479       | 5.708       | 4.597       |
| 3.45                 | 7.858       | 7.639       | 7.408       | 7.091       | 6.749       | 5.999       | 4.909       |
| 3.50                 | 8.086       | 7.877       | 7.656       | 7.349       | 7.019       | 6.290       | 5.221       |
| 3.55                 | 8.313       | 8.114       | 7.905       | 7.607       | 7.289       | 6.582       | 5.532       |
| 3.60                 | 8.541       | 8.351       | 8.153       | 7.866       | 7.558       | 6.873       | 5.844       |
| 3.65                 | 8.769       | 8.589       | 8.401       | 8.124       | 7.828       | 7.164       | 6.156       |
| 3.70                 | 8.997       | 8.826       | 8.649       | 8.382       | 8.098       | 7.455       | 6.467       |
| 3.75                 | 9.225       | 9.063       | 8.897       | 8.640       | 8.367       | 7.747       | 6.779       |
| 3.80                 | 9.452       | 9.301       | 9.145       | 8.899       | 8.637       | 8.038       | 7.090       |
| 3.85                 | 9.680       | 9.538       | 9.393       | 9.157       | 8.907       | 8.329       | 7.402       |
| 3.90                 | 9.908       | 9.775       | 9.641       | 9.415       | 9.176       | 8.621       | 7.714       |
| 3.95                 | 10.136      | 10.013      | 9.890       | 9.673       | 9.446       | 8.912       | 8.025       |
| 4.00                 | 10.364      | 10.250      | 10.138      | 9.932       | 9.716       | 9.203       | 8.337       |
| 4.05                 | 10.591      | 10.487      | 10.386      | 10.190      | 9.986       | 9.495       | 8.649       |
| 4.10                 | 10.819      | 10.725      | 10.634      | 10.448      | 10.255      | 9.786       | 8.960       |
| 4.15                 | 11.047      | 10.962      | 10.882      | 10.707      | 10.525      | 10.077      | 9.272       |
| 4.20                 | 11.275      | 11.199      | 11.130      | 10.965      | 10.795      | 10.368      | 9.583       |
| 4.25                 | 11.503      | 11.437      | 11.378      | 11.223      | 11.064      | 10.660      | 9.895       |
| 4.30                 | 11.730      | 11.674      | 11.626      | 11.481      | 11.334      | 10.951      | 10.207      |
| 4.35                 | 11.958      | 11.911      | 11.875      | 11.740      | 11.604      | 11.242      | 10.518      |
| 4.40                 | 12.186      | 12.149      | 12.123      | 11.998      | 11.874      | 11.534      | 10.830      |
| 4.45                 | 12.414      | 12.386      | 12.371      | 12.256      | 12.143      | 11.825      | 11.142      |
| 4.50                 | 12.642      | 12.623      | 12.619      | 12.515      | 12.413      | 12.116      | 11.453      |
| 4.55                 | 12.869      | 12.861      | 12.867      | 12.773      | 12.683      | 12.408      | 11.765      |
| 4.60                 | 13.097      | 13.098      | 13.115      | 13.031      | 12.952      | 12.699      | 12.076      |
| 4.65                 | 13.325      | 13.335      | 13.363      | 13.289      | 13.222      | 12.990      | 12.388      |
| 4.70                 | 13.553      | 13.573      | 13.611      | 13.548      | 13.492      | 13.281      | 12.700      |

For each additional 0.05 meter depth:

|        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|
| +0.228 | +0.237 | +0.248 | +0.258 | +0.270 | +0.291 | +0.312 |
|--------|--------|--------|--------|--------|--------|--------|

## TRENCH BACKFILL FOR ARCH PIPES, METRIC



W = Width of Trench (meters)

D = Depth from Subgrade to Pipe Invert (meters)

H = Height of Trench Backfill Limits (meters) = (D - B)

B = Distance from Pipe Invert to Springline (meters) (See Table)

L = Length of Trench (meters)

A = End Area of Pipe above Springline (square meters) (See Table)

Volume (cubic meters) = [(H x W) - A] x L

This formula should be used by the designer or field engineer to determine the volume of TRENCH BACKFILL that should be paid for when backfilling storm sewer trenches utilizing reinforced concrete ARCH PIPE. Maximum trench widths permitted by Article 550.04 of the Standard Specifications are used.

## Volume of Trench Backfill (cu m) Per Lineal Meter Of Reinforced Concrete Pipe Arch Storm Sewer

| Equivalent<br>Round Size (mm) |          | Rise |        | Span |        | Wall<br>Thickness<br>(mm) | End Area<br>Above<br>Springline<br>(sq m) | B<br>(m) |
|-------------------------------|----------|------|--------|------|--------|---------------------------|---|----------|
|                               |          | (mm) | (inch) | (mm) | (inch) |                           |   |          |
| 375                           | (15 in)  | 279  | 11.0   | 457  | 18.0   | 57                        | 0.100                                     | 0.119    |
| 450                           | (18 in)  | 343  | 13.5   | 559  | 22.0   | 64                        | 0.132                                     | 0.152    |
| 525                           | (21 in)  | 394  | 15.5   | 660  | 26.0   | 70                        | 0.180                                     | 0.158    |
| 600                           | (24 in)  | 457  | 18.0   | 724  | 28.5   | 76                        | 0.257                                     | 0.149    |
| 675                           | (27 in)  | 572  | 22.5   | 921  | 36.3   | 89                        | 0.390                                     | 0.195    |
| 750                           | (30 in)  | 572  | 22.5   | 921  | 36.3   | 89                        | 0.390                                     | 0.195    |
| 900                           | (36 in)  | 676  | 26.6   | 1111 | 43.8   | 102                       | 0.561                                     | 0.216    |
| 1050                          | (42 in)  | 795  | 31.3   | 1299 | 51.1   | 114                       | 0.762                                     | 0.256    |
| 1200                          | (48 in)  | 914  | 36.0   | 1486 | 58.5   | 127                       | 0.991                                     | 0.296    |
| 1350                          | (54 in)  | 1016 | 40.0   | 1651 | 65.0   | 140                       | 1.214                                     | 0.329    |
| 1500                          | (60 in)  | 1143 | 45.0   | 1854 | 73.0   | 152                       | 1.518                                     | 0.372    |
| 1650                          | (66 in)  | 1372 | 54.0   | 2235 | 88.0   | 178                       | 2.207                                     | 0.433    |
| 1800                          | (72 in)  | 1372 | 54.0   | 2235 | 88.0   | 178                       | 2.207                                     | 0.433    |
| 2100                          | (84 in)  | 1575 | 62.0   | 2591 | 102.0  | 203                       | 2.146                                     | 0.472    |
| 2250                          | (90 in)  | 1829 | 72.0   | 2921 | 115.0  | 216                       | 3.684                                     | 0.604    |
| 2400                          | (96 in)  | 1962 | 77.3   | 3099 | 122.0  | 229                       | 4.280                                     | 0.619    |
| 2700                          | (108 in) | 2213 | 87.1   | 3505 | 138.0  | 254                       | 5.488                                     | 0.683    |
| 3000                          | (120 in) | 2461 | 96.9   | 3912 | 154.0  | 279                       | 6.601                                     | 0.796    |
| 3300                          | (132 in) | 2705 | 106.5  | 4286 | 168.8  | 254                       | 6.777                                     | 1.155    |

### EXAMPLE

Given: Pipe = 750 mm Round size eq., rise = 572 mm, span = 921 mm

Average Depth, D = 1.43 m

Trench Length = 25.1 m

Width, W = 2.01 m

Find: Cubic Meters of TRENCH BACKFILL

Solution: From Table: End Area, A = 0.39 sq. m

B = 0.195 m  $\approx$  0.20 m

Pay Height, H = D – B = 1.43 - 0.20 = 1.23 m

Volume = [(H x W) - A] x L = [(1.23)(2.01) - 0.39](25.1)

TRENCH BACKFILL VOLUME = 52.3 cu. m<sup>3</sup>



# **Section F**

## **DOCUMENTATION EXAMPLES**

### **QUANTITY BOOK, PROGRESS AND FINAL DOCUMENTATION**

**The following pages of this Section contain examples for the Quantity Book and typical cross-reference progress and final documentation.**



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**County** CHAMPAIGN  
**Section** (10-33HB)BDR  
**Route** FAI 57  
**District** 05  
**Contract Number** 70924  
**Job Number** C-95-031-11

**Project Number**

**Year**

2016

**IF FOUND RETURN TO:**

Illinois Dept. of Transportation

13473 IL Hwy 133

P.O. Box 610

Paris IL 61944-0610

**Resident Name** Sheldon Cooper  
**Project Phone** (217) 251-XXXX  
**Contractor's Name** Murphy Construction  
**Contractors Address** 604 E Green St  
**Contractor City** Champaign  
**Contractor Phone** (217 ) 891-XXXX

All entries made by Resident unless otherwise noted:

Sheldon Cooper SC

Resident Signature

Leonard Hoftstadter

LH

Raj Koothrappali

R.K.

Howard Wolowitz

HW

## Diary Entry Example

|   |                                  |
|---|----------------------------------|
|   | Wed. MAY 30                      |
| Hours Worked: 11.0  |                                  |
| Weather: Cloudy, Warm   |                                  |
| Temp: 75°F  |                                  |
| Controlling Item: Earth Ex  |                                  |
| Working Day Charged: 1.0  |                                  |
|   |                                  |
| <u>Kilian</u> : Worked from 12p to 7p placing Bit. on shldr at 17 <sup>th</sup> |                                  |
| St. Sawcutting crew worked at Royal Heights Road.                               |                                  |
|   |                                  |
| <u>Baxmeyer</u> : Worked on Earth Ex and pipe culverts                          |                                  |
|   |                                  |
| <u>Craig</u> : Finished setting forms on floor slab of box culvert              |                                  |
|   |                                  |
| Kilian supplied completed Engrs Field Office TY A                               |                                  |
| on this date, begin payment. J. Smith (SFE) visited job                         |                                  |
| site today. Union Pacific RR provided 2 RR flaggers for                         |                                  |
| 11 hours.   |                                  |
| (Traffic Control)   | → T.C. okay at 7AM and 5PM       |
|   | Baxmeyer: 6 OP - 5 LAB - 1 TMSTR |
|   | Kilian: 7 LAB - 4 OP - 1 TMSTR   |
|   | Craig (DBE): 2 CAR 1 LAB         |
|   |                                  |

|                  |              |                                     |                            |                |
|------------------|--------------|-------------------------------------|----------------------------|----------------|
| <b>Contract:</b> | 70924        | <b>State of Illinois</b>            | <b>Resident:</b>           | Jason R. Smith |
| <b>County:</b>   | CHAMPAIGN    | <b>Department of Transportation</b> | <b>Supervisor:</b>         | Mike Carnahan  |
| <b>Section:</b>  | (10-33HB)BDR | <b>ICORS System</b>                 | <b>Field Office Phone:</b> | (217)251-4749  |
|                  |              | <b>Diary of Resident Engineer</b>   | <b>Job Number:</b>         | C-95-031-11    |
| <b>Route:</b>    | FAI 57       |                                     | <b>Project:</b>            | N/A            |
| <b>District:</b> | 05           |                                     |                            |                |

---

|                                |   |                             |      |
|--------------------------------|---|-----------------------------|------|
| <b>Date</b>                    | Thursday, July 12, 2012   | <b>Weekly Report Number</b> | 7    |
| <b>Controlling Item</b>        | Microsilica Overlay   |                             |      |
| <b>Persons Working</b>         | 6.00  | <b>Hours Worked</b>         | 8.00 |
| <b>Weather</b>                 | 7am 61 Cloudy 12p 85 Cloudy 3p 88 Cloudy  |                             |      |
| <b>Working Days Charged</b>    | 0.00  | <b>Workable Days</b>        | 1.00 |
| <b>Weekly Report Paragraph</b> | Oneil removed protective shield and began digging out for Class D patches on the bridge ends  |                             |      |
| <b>Additional Paragraphs</b>   | <p>Traffic Control inspected by Jason Smith at 7am and no problems found</p> <p>Contacted Tom Proctor to let him know asphalt could not be vibratory rolled near the bridge deck until the 7 day cure time had lapsed. The patching is not scheduled for Tuesday.</p> |                             |      |



|                 |             |              |
|-----------------|-------------|--------------|
| Contract Number | District    | Letting Date |
| 70924           | 5           | 01/20/12     |
| Route           | County      |              |
| FAI 57          | Champaign   |              |
| Project Number  | Job Number  |              |
| N/A             | C-95-031-11 |              |
| Section Number  |             |              |
| (10-33HB)BDR    |             |              |

|  |             |                          |                       |                           |
|--|-------------|--------------------------|-----------------------|---------------------------|
| Report Number                                  | Week Ending | % Complete               | Contract Price        | Estimated Completion Date |
| 7  | 07/14/12    | 46%                      | \$409,252.83          | 08/03/12                  |
| Contractor                                     |             | Contract Completion Date | Contract Working Days | Time Limit Extended to    |
| Oneil Brothers, a Division of MACC of ILL, INC |             | 08/03/12                 | 0.00                  |                           |
| Average Number of Persons Working              | Execution   | Start                    | Reports Suspended     | Reports Resumed           |
| 7  | 02/29/12    | 05/29/12                 |                       | 08/03/12                  |

Resident Name

Jason R. Smith

| Date            | Day | Hours Worked | Controlling Item    | Working Days Charged | Workable Days | Provide summary of Contractor's and Subcontractor's operations each day. Compare performance with Progress Schedule. A reason must be provided when less than a full working day is charged. |
|-----------------|-----|--------------|---------------------|----------------------|---------------|--|
| 07/08/12        | Sun | 0            | Microsilica Overlay | 0                    | 0             | No work. No workable day due to rain on the jobsite  |
| 07/09/12        | Mon | 8            | Microsilica Overlay | 0                    | 1             | Oneil wetting the deck and covering in preparation of the microsilica overlay scheduled for the following day  |
| 07/10/12        | Tue | 10           | Microsilica Overlay | 0                    | 1             | Oneil placed the microsilica overlay on this day   |
| 07/11/12        | Wed | 8            | Microsilica Overlay | 0                    | 1             | Oneil removed protective shield  |
| 07/12/12        | Thu | 8            | Microsilica Overlay | 0                    | 1             | Oneil removed protective shield and began digging out for Class D patches on the bridge ends   |
| 07/13/12        | Fri | 8            | Microsilica Overlay | 0                    | 1             | Oneil removed protective shield and began digging out for Class D patches on the bridge ends. Also placed the polymer concrete over the bridge joints.                                       |
| 07/14/12        | Sat | 0            | Microsilica Overlay | 0                    | 1             | No work  |
| Total this week |     |              |                     | 0                    | 6             |  |
| Previous Total  |     |              |                     |                      | 38            |  |
| Total to Date   |     |              |                     |                      | 44            |  |

Will Contractor complete project on time at present rate of progress? ☒ Yes ☐ No

If No, Why?

|  |
|--|
|  |
|--|

Printed 09/09/25

Page 1 of 2

BC 239 (Rev. 08/19/20)

Have you discussed rate of progress with Contractor this week? ☒ Yes ☐ No

If No, Why?

|  |
|--|
|  |
|--|

|            |                   |                |                        |
|------------|-------------------|----------------|------------------------|
| Orig. c.c. | Regional Engineer | Resident       | Field Telephone Number |
|            | Contractor        | Jason R. Smith | (217) 521-4749         |
|            | Bur. Construction |                |                        |
|            | Project File      |                |                        |

NOTE: See reverse side for detailed instructions for preparing Form BC 239. If the Contractor disagrees with the working day charges, detailed reasons must be expressed in writing to the Regional Engineer within 7 days after receipt of the report.

# IDOT QUANTITY BOOK

|                           |                                      |
|---------------------------|--------------------------------------|
| <b>County</b>             | CHAMPAIGN                            |
| <b>Section</b>            | (10-33HB)BDR                         |
| <b>Route</b>              | FAI 57                               |
| <b>District</b>           | 05                                   |
| <b>Contract Number</b>    | 70924                                |
| <b>Job Number</b>         | C-95-031-11                          |
| <b>Project Number</b>     |                                      |
| <b>Resident's Name</b>    | Sheldon Cooper                       |
| <b>Field Office Phone</b> | (217) 251-XXXX                       |
| <b>Supervisor Name</b>    | Amy Farrah Fowler                    |
| <b>Contractor Name</b>    | Murphy Construction                  |
| <b>Contractor Address</b> | 604 E Green St<br>Champaign IL 61820 |
| <b>Contractor Phone</b>   | (217) 891-XXXX                       |

If found, please return this to the Resident Engineer or forward it to the District Office address below

Illinois Dept. of Transportation

13473 IL Hwy 133

P.O. Box 610

Paris IL 61944-0610

# IDOT QUANTITY BOOK

|                       |                 |                       |                 |    |
|-----------------------|-----------------|-----------------------|-----------------|----|
| INDEX<br>OF<br>SHEETS | <b>COUNTY</b>   | 177                   | <b>DISTRICT</b> | 02 |
|                       | <b>SECTION</b>  | 20RS-1 & 20BR         |                 |    |
|                       | <b>ROUTE</b>    | FAP 5                 |                 |    |
|                       | <b>CONTRACT</b> | 84776                 |                 |    |
|                       | <b>JOB NO</b>   | C-92-072-12           |                 |    |
|                       | <b>PROJECT</b>  | STPF-BRF-0005/050/000 |                 |    |

| FASID  | ITEM NO  | PAGE | DESCRIPTION                   |
|--------|----------|------|-------------------------------|
| Q10C01 | 20300100 | 1    | CHANNEL EXCAV                 |
|        | 28100107 | 2    | STONE RIPRAP CL A4            |
|        | 28200200 | 3    | FILTER FAB                    |
|        | 50100100 | 4    | REM EXIST STRUCT              |
|        | 50200100 | 5    | STRUCTURE EXCAVATION          |
|        | 50300100 | 6    | FLOOR DRAINS                  |
|        | 50300208 | 7    | CONC ENCASE                   |
|        | 50300225 | 8    | CONC STRUCT                   |
|        | 50300255 | 9    | CONC SUP-STR                  |
|        | 50300260 | 10   | BR DECK GROOVING              |
|        | 50300300 | 11   | PROTECTIVE COAT               |
|        | 50800205 | 12   | REINF BARS, EPOXY CTD         |
|        | 50800515 | 13   | BAR SPLICERS                  |
|        | 51200700 | 14   | FUR CONC PILES                |
|        | 51202305 | 15   | DRIVE CONC PILES              |
|        | 51204200 | 16   | TEST PILE CONCRETE            |
|        | 51205200 | 17   | TEMP SHT PILING               |
|        | 51500100 | 18   | NAME PLATES                   |
|        | 66700205 | 19   | PERM SURV MKRS T1             |
|        | 70106500 | 20   | TEMP BR TRAF SIGNALS          |
| 3AAL01 | X0322352 | 21   | SEEDING MOBILIZATION          |
|        | X2500200 | 22   | TEMP SEEDING                  |
|        | 40600645 | 23   | LEV BIN MM, N90               |
|        | 40603090 | 24   | HMA BINDER CSE, IL-19.0, N90  |
|        | 40603345 | 25   | HMA SURFACE CSE, MIX "D", N90 |
|        | Z0013798 | 26   | CONSTRUCTION LAYOUT           |
|        | Z0028415 | 27   | GEOTECHNICAL REINF            |
|        | FRC00100 | 28   | CONSTRUCTING TEST STRIP       |
|        | X9200400 | 29   | TRAF CONT & PROT              |



For all tonnage items  
weighed on platform scales:  
Scales checked by  
Dept. Of Agriculture  
Date on decal 04/05/16  
Identification No. 01-2345  
Scale Location Sterling, IL

## Inspection Reports

[illegible]



|                  |              |                                     |                            |               |
|------------------|--------------|-------------------------------------|----------------------------|---------------|
| <b>Contract:</b> | 76308        | <b>State of Illinois</b>            | <b>Resident:</b>           | Brett Schwalb |
| <b>County:</b>   | MADISON      | <b>Department of Transportation</b> | <b>Supervisor:</b>         | Ted Nemsy     |
| <b>Section:</b>  | 60-(4,5)RS-2 | <b>ICORS System</b>                 | <b>Field Office Phone:</b> | (618)288-5071 |
|                  |              | <b>Daily Quantities</b>             | <b>Job Number:</b>         | C-98-123-10   |
| <b>Route:</b>    | FAI 270      |                                     | <b>Project:</b>            | N/A           |
| <b>District:</b> | 08           |                                     |                            |               |

---

|  |  |              |   |                              |                    |
|--|--|--------------|---|------------------------------|--------------------|
| <b>DQ Number:</b>                        | 41   | <b>Date:</b> | 06/16/2016  | <b>Contractor:</b>           | Keeley & Sons, Inc |
| <b>Pay Item Key:</b>                     | 44200204-Q050J01-119I0002A-A                   |              | PAVT PATCH T3 17                                  |                              |                    |
| <b>Qty Inspected:</b>                    | 24.40  | SQ YD        | <b>Posted</b> <input checked="" type="checkbox"/> | <b>Paid on Estimate Nbr:</b> | 2                  |
|  |  |              |   | <b>Estimate or Final:</b>    | Final              |
| <b>Evidence of Inspection:</b>           | Plant Report & Tickets and Test in File        |              |   |                              |                    |
| <b>Location:</b>                         | I-270 WB Driving lane Station 837+55 to 816+50 |              |   |                              |                    |
| <b>Source of Progress Documentation:</b> | Field book # 3, page 2                         |              |   |                              |                    |

**Contract:** 76308  
**County:** MADISON  
**Section:** 60-(4,5)RS-2  
**Route:** FAI 270  
**District:** 08

**State of Illinois**  
**Department of Transportation**  
**ICORS System**  
**Quantity Book**

**Resident:** Brett Schwalb  
**Supervisor:** Ted Nemsky  
**Field Office Phone:** (618)288-5071  
**Job Number:** C-98-123-10  
**Project:** N/A

**PAVT PATCH T3 17**

**PAVT PATCH T3 17**

**Subjob A**

**UnitPrice \$81.6000**

**Adjusted Total Qty: 83.330**

**FLD BK #3 PG24**

**Yes**

**Authorizations:**

| Auth Number | Auth Letter | CCS Code  | Date Approved | Added Qty | Deducted Qty |
|-------------|-------------|-----------|---------------|-----------|--------------|
| 4           |             | 119I0002A | 07/14/2016    | 16.330    | 0.000        |

**Quantities:**

| CCS Code   | DQ Nbr | Date       | Qty Inspected | To Date | Evidence of Inspection                  | Source of Progress Documentation: | Estimate # |
|--|--------|------------|---------------|---------|---|-----------------------------------|------------|
| 119I0002A  | 41     | 06/16/2016 | 24.400        | 24.400  | Plant Report & Tickets and Test in File | Fld bk # 3 pg 2                   | 2          |
| Location: I-270 WB Driving lane Sta 837+55 to 816+50 |        |            |               |         |   |                                   |            |
| Estimate or Final: Final                             |        |            |               |         |   |                                   |            |
| 119I0002A  | 53     | 06/17/2016 | 42.930        | 67.330  | Plant Report & Tickets & Test in File   | fld bk # 3 pg 3                   | 2          |
| Location: I-270 WB sta 815+95 to 792+75              |        |            |               |         |   |                                   |            |
| Estimate or Final: Final                             |        |            |               |         |   |                                   |            |
| 119I0002A  | 157    | 06/21/2016 | 16.000        | 83.330  | Plant Report & Tickets & Test in File   | FLD BK # 3 pg 4                   | 3          |
| Location: I-270 WB DL PATCH # 34 A                   |        |            |               |         |   |                                   |            |
| Estimate or Final: Final                             |        |            |               |         |   |                                   |            |

Friday, July 22, 2016

Report Name: Quantity Book

FIELD BOOK # 4 - BRIDGE

IF FOUND PLEASE RETURN TO:

REGIONAL ENGINEER  
Name ILLINOIS DEPT. OF TRANSPORTATION  
DISTRICT 4  
Address 401 MAIN STREET  
PEORIA, IL 61202-1111  
Phone (OPTIONAL)

Knox  
5-5HB-2  
FA 206  
4  
12345  
C-94-789-12

This book is published on a fine 50% cotton-content ledger paper, specially treated for maximum archival service, and protected by a water resistant surface sizing.

Projects

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| BRIDGE APPR. SHLDR MEAS. & CALCS | 17-18 |

DATE: 6/7/16 BRIDGE BUILDERS CO.

WEATHER: P. CLOUDY & WARM

AIR TEMP - 7:00 AM: 60°

NOON: 70°

3:00 PM: 75°

POUR START TIME: 7:00 AM

POUR END TIME: 2:00 PM

CURING COVER COMPLETE: 4:00 PM

BRIDGE SKEW: 15°

FINISHING MACHINE: BIDWELL

FINISHING MACHINE ORIENTATION: 90°

DRY RUN COMPLETED: 6/4/16

INSPECTORS: EAL, CR

COMMENTS: FINISHING MACHINE

| LOCATION             | REBAR DEPTH | CONC. DEPTH |
|----------------------|-------------|-------------|
| E. ABUT.             | 2 1/4"      | 8"          |
| 1/4 SPAN 1           | 2 3/8"      | 8 1/8"      |
| MID-SPAN 1           | 2 1/4"      | 8"          |
| 3/4 SPAN 1           | 2 1/4"      | 8"          |
| PIER 1               | 2 1/4"      | 8"          |
| 1/4 SPAN 2           | 2 3/8"      | 8 1/8"      |
| MID-SPAN 2           | 2 1/4"      | 8 1/8"      |
| 3/4 SPAN 2           | 2 1/4"      | 8"          |
|                      | 2 1/4"      | 8"          |
| PLAN DEPTH OF REBAR: | 2 1/4"      |             |
| PLAN DECK THICKNESS: | 8"          |             |

# 42100200 CONT REINF PCC PAVT 9

|                                     |                    |
|-------------------------------------|--------------------|
| DATE: 6/7/16                        | RIVER BLUFF PAVING |
| WEATHER: CLOUDY                     | INSPECTORS:        |
| 68° @ 7:30 AM                       | ZOE HEINZ          |
| 75° @ NOON                          | TOM DUNCAN         |
| 72° @ 4:30 PM                       |                    |
| LOCATION: WB STA 360+00 TO 383+22   |                    |
| LENGTH = 2322'                      | WIDTH = 24'        |
| EQUIPMENT:                          |                    |
| *SKI OPERATED CMI SLIPFORM SPREADER |                    |
| *SKI OPERATED CMI SLIPFORM PAVER    |                    |
| *STRING-GUIDED CMI TING MACHINE     |                    |
| W/ ASTROTURE DRAG                   |                    |
| *STRING-GUIDED CMI MEMBRANE SPRAYER |                    |
| TRUCKS: ALL AGITATING               |                    |
| AVG. HAUL TIME = 20MIN.             |                    |
| SEE TICKETS FOR REV. COUNT          |                    |
| 15 MIN BREAKDOWN @ STA 376+00       |                    |
| REINFORCING:                        |                    |
| *BAR LAP DETAIL #2 (STD 2225)       |                    |
| *KEYWAY & BARS                      |                    |
| *DEPTH: 3 1/2 ±1/2"                 |                    |
| Meas. By: ZH, JD                    | 6/7/16             |
| Calc. By: ZH                        | 6/7/16             |
| Ckd. By: JD                         | 6/7/16             |

\* Note: Record only on 1st day.

| STATION  | A/R (%) | SLUMP  | BEAMS |
|--|---------|--------|-------|
| 360+00   | 5.0     | 1"     |       |
| 362+50   | 5.2     |        |       |
| 365+00   | 5.4     |        | P-1-A |
| 367+50   | 5.5     | 1 1/4" | P-1-B |
| 370+00   | 5.2     |        |       |
| 372+50   | 5.2     |        |       |
| 375+00   | 4.9     | 1 1/2" |       |
| 377+50   | 5.3     |        |       |
| 380+00   | 5.6     |        |       |
| 382+50   | 5.5     |        |       |
| AREA = 2322' X 24' = 55728 SF                    |         |        |       |
| REQ'D VOLUME = 55728 X 9 X 1 = 1548 CY           |         |        |       |
| DELIVERED (FROM TICKETS) = 1672 CY               |         |        |       |
| YIELD = 1672 X 100 = 108%                        |         |        |       |
| 1548   |         |        |       |
| TYPE 3 MEMBRANE CURING - ILL OK STAMP            |         |        |       |
| REQ'D = L X W X 2 APPL = 2322(25.5') 2 = 474 GAL |         |        |       |
| 250 SF/GAL 250 GAL/SY                            |         |        |       |
| (NOTE: WIDTH = 24' + 9/12 + 9/12 = 25.5')        |         |        |       |
| USED 9 BARRELS @ 55 GAL/BAR = 495 GAL ✓ OK       |         |        |       |

# 40603085 HMA BINDER CSE IL-19.0 N70

DATE: 6/20/16 HEINZ PAVING  
WEATHER: SUNNY INSPECTORS:  
65° @ 6:30 AM EMILY DUNCAN  
90° @ 2:30 PM MATT PATEL

LOCATION: WB STA 37+20 TO 115+80

LENGTH = 7860'

MAT WIDTH = 12'

MAT THICKNESS = 1.5"

EQUIPMENT:

PAVER: BARBER-GREENE SA 131

VIB ROLLER: DYNAPAC 42A; TACH=2400 VPM

PNEUMATIC ROLLER: INGRAM

FINISH ROLLER: GALLION 266B; STATIC MODE

MAX SPEED =  $\frac{2400 \text{ VPM}}{10} = 240 \text{ FT/MIN}$

VIB ROLLER 10 IMPACTS/FT

ROLLING PATTERN:

4 PASSES REQ'D OVER EACH POINT

9 PASSES FOR FULL MAT WIDTH

MAX PAVER =  $\frac{240 \text{ FT/MIN}}{9} \times 0.9 = 24 \text{ FT/MIN}$

SPEED 9 PASSES

Meas. By: ED, MP 6/28/16

Calc. By: ED 6/28/16

Chkd. By: MP 6/28/16

PQ. 67

| TEMP     | IN TRUCK | BEHIND PAVER |
|----------|----------|--------------|
| 8:00 AM  | 295°     | 280°         |
| 10:00 AM | 290°     | 270°         |
| 12 NOON  | 305°     | 285°         |
| 2:00 PM  | 310°     | 290°         |

YIELD CHECKS:

1. THEORETICAL TRUCK DUMPING DISTANCE, D

$$D = \frac{12 \text{ TONS/TRUCK}(2000 \text{ LBS/TON})(9 \text{ SF/SY})}{12'(112 \text{ LBS/SY-IN})(1.5'')} = 107 \text{ FT/TRUCK}$$

2. THEORETICAL TONS PER STATION, T<sub>S</sub>

$$T_s = \frac{(12' \times 100')(112 \text{ LBS/SY-IN})(1.5'')}{(9 \text{ SF/SY})(2000 \text{ LBS/TON})} = 11.2 \text{ TONS}$$

3. DAILY TOTAL YIELD CHECK:

$$\text{THEO.} = \frac{(12' \times 7860')(112 \text{ LBS/SY-IN})(1.5'')}{(9 \text{ SF/SY})(2000 \text{ LBS/TON})} = 880.3 \text{ TONS}$$

TONS DELIVERED = 897.9 (SEE TICKET FILE)

$$\text{YIELD} = \frac{\text{DELIVERED}}{\text{THEORETICAL}} = \frac{897.9}{880.3} = 102\%$$

MAT'L INSP: PLANT REPORT, TICKETS & TEST

70300100 SHORT TERM PAVT MARKING

WB STA 37+20 TO 115+50

195 SKIP-DASHES x 4' EACH = 780'



Date September 7, 2016 Contract No. 90632 Mix Design No. 85PCC6427

Pay Item No. and Description 42000400 PCC PAVEMENT 9"

Resident Matt Young Contractor A1 Construction Company

| Inspectors      | Visitors          | Weather | Time    | Temp. | Conditions |
|-----------------|-------------------|---------|---------|-------|------------|
| Amber Weiser    | Greg Idleman - FE |         | 7:00 AM | 70    | Sunny, Dry |
| Steve Blakeney  |                   |         | Noon    | 81    | Sunny, Dry |
| Todd Richardson |                   |         | 3:00 PM | 85    | Sunny, Dry |

| Start Sta. | End Sta. | Distance |   | Width |   |     |   | Sq. Yds. |
|------------|----------|----------|---|-------|---|-----|---|----------|
| 1508+00    | 1516+00  | 800.0 ft | x | 24 ft | x | 1/9 | = | 2133.3   |
|            |          |          | x |       | x | 1/9 | = |          |
|            |          |          | x |       | x | 1/9 | = |          |
|            |          |          | x |       | x | 1/9 | = |          |
|            |          |          | x |       | x | 1/9 | = |          |
|            |          |          | x |       | x | 1/9 | = |          |

| Contractor's Paving Equipment |                  | Trucks            |   |
|-------------------------------|------------------|-------------------|---|
| Spreader                      |                  | Non-agitating     | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| Paver                         | GomaCO GP - 2500 | Agitating         | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Tining Maching                | GomaCO T/C - 600 | Average Haul Time | 20 Min  |
| Curing Sprayer                |                  |                   |   |
|                               |                  |                   |   |
|                               |                  |                   |   |

Rebar Lap Detail \_\_\_\_\_ Rebar Depth \_\_\_\_\_  
Tie Bar Depth \_\_\_\_\_

| Daily Yield     |  |       |           |
|-----------------|--|-------|-----------|
| Required Volume | $\frac{2133.3 \text{ (Total sq. yds.)} \times .75 \text{ (Thickness in feet)}}{3} =$                     | 533.3 | Cu. Yds.  |
| Used Volume     | $61 \text{ No. of batches or truck (x) } 9 \text{ cu. yds/batch or truck} =$                             | 549.0 | Cu. Yds.  |
| Surplus         | $\left( \frac{549 \text{ (Used)} - 533.3 \text{ (Req'd.)}}{533.3 \text{ (Req'd.)}} \right) \times 100 =$ | 2.94  | % Surplus |

| Membrane Curing  |   |            |         |
|------------------|---|------------|---------|
| Type             | Type II   | Inspection | LA - 15 |
| Required Gallons | $\frac{800 \text{ (L)} \times 24 \text{ (W)} \times 2 \text{ (Applic.)}}{250 \text{ Sq. ft./gal.}} =$ | 153.6      | Gals.   |
| Used Gallons     | 3 Barrels (x) 55 Gals./Barrel =   | 165.0      | Gals.   |

| Tests   |       |       |                     |                |              |         |       |       |                     |                |              |
|---------|-------|-------|---------------------|----------------|--------------|---------|-------|-------|---------------------|----------------|--------------|
| Station | % Air | Slump | Beams/<br>Cylinders | Conc.<br>Temp. | Air<br>Temp. | Station | % Air | Slump | Beams/<br>Cylinders | Conc.<br>Temp. | Air<br>Temp. |
| 1508+00 | 06.50 | 2 ¾"  | 6                   | 76             | 70           |         |       |       |                     |                |              |
| 1509+00 | 05.20 | 2 ½"  | -----               | 78             | 75           |         |       |       |                     |                |              |
| 1509+85 | 05.30 | ----- | -----               | 78             | 77           |         |       |       |                     |                |              |
| 1510+70 | 05.70 | 3"    | -----               | 80             | 79           |         |       |       |                     |                |              |
| 1511+55 | 05.90 | 2 ¾"  | -----               | 80             | 80           |         |       |       |                     |                |              |
| 1512+40 | 06.10 | 3"    | 4                   | 83             | 80           |         |       |       |                     |                |              |
| 1513+25 | 05.90 | ----- | -----               | 83             | 81           |         |       |       |                     |                |              |
| 1514+15 | 05.90 | 3"    | -----               | 84             | 85           |         |       |       |                     |                |              |
| 1515+50 | 06.00 | 2 ½"  | -----               | 84             | 88           |         |       |       |                     |                |              |

| Calculations / Measurements / Misc. |                              |              |                      |
|-------------------------------------|------------------------------|--------------|----------------------|
| Yield Checks                        |                              | Depth Checks |                      |
| 1) From Sta. 1508+00 - 1510+00      | <u>135.0</u>                 |              |                      |
| Actual = 135.0 cuyd                 | $133.3 \times 100 = 101.3\%$ | @1508+25     | 9" – EOP             |
| Theo.= 133.3 cuyd                   |                              |              | 9 ¼ " – Lane Line    |
|                                     |                              |              | 9 ½ " – EOP(North)   |
| 2) From Sta. 1508+00 – 1512+00      | <u>270.0</u>                 | @1510+75     | 9 1/8 " – EOP        |
| Actual = 270.0 cuyd                 | $266.7 \times 100 = 101.2\%$ |              | 9" – Lane Line       |
| Theo.= 266.7 cuyd                   |                              |              | 9 3/8" – EOP (North) |
| 3) From Sta. 1508+00 to 1514+00     | <u>423.0</u>                 | @1513+25     | 9" – EOP             |
| Actual = 423.0 cuyd                 | $400.0 \times 100 = 105.8\%$ |              | 9 3/8 " – Lane Line  |
| Theo.= 400.00 cuyd                  |                              |              | 9 ½ " – EOP (North)  |
| 4) From Sta. 1508+00 to 1516+00     | <u>549.0</u>                 | @1515+75     | 9 ¼ " – EOP          |
| Actual = 549.0 cuyd                 | $533.3 \times 100 = 102.9\%$ |              | 9" – Lane Line       |
| Theo.= 533.3 cuyd                   |                              |              | 9 ¼ " – EOP (North)  |





Date June 20, 2016 Contract Number 70812 Mix Design No. 86 BIT 1536

Payment Item No. & Description 40603360 Hot-Mix Asphalt Surface, Mix E, N50

Resident John Preston Contractor AI Construction Company

| Inspectors  | Visitors         | Weather | Time   | Temp. | Conditions |
|-------------|------------------|---------|--------|-------|------------|
| John Dough  | Bill Smith, F.E. |         | 6:30AM | 65° F | Sunny      |
| Robert Fell |                  |         | 2:30PM | 90° F | Sunny      |
|             |                  |         |        |       |            |

| Start Sta. | End Sta. | Mat Width | Mat Thick | Tons Placed Today    | 920.6 tons |
|------------|----------|-----------|-----------|----------------------|------------|
| WB 37+20   | 115+80   | 12 ft.    | 1.5 inch  | Theo. Tons Today     | 901.2 tons |
|            |          |           |           | +/- Tons Today       | +19.4 tons |
|            |          |           |           | Daily Yield (%)      | 102%       |
|            |          |           |           | Cumulative Yield (%) |            |

| Contractor's Paving Equipment |                                 |           |         |           |  |
|-------------------------------|---------------------------------|-----------|---------|-----------|--|
| Paver                         | Barber-Greene SA - 131          | Reed Tach |         |           |  |
| Mat'l Transfer Device         | RoadTech Shuttlebuggy 2500      |           |         |           |  |
| Breakdown Roller              | Dynapac CC 42A                  | Reed Tach | 2400VPM | Amplitude |  |
| Vibratory Roller              |                                 | Reed Tach |         | Amplitude |  |
| Pneumatic Roller              | Ingram                          |           |         |           |  |
| Finish Roller                 | Gallion V05 2-66 B, Static Mode |           |         |           |  |

|                          |            |                     |   |             |                     |          |                  |      |   |           |
|--------------------------|------------|---------------------|---|-------------|---------------------|----------|------------------|------|---|-----------|
| Max Vib.<br>Roller Speed | 2400<br>10 | VPM<br>impacts/foot | = | 240 ft./min | Max. Paver<br>Speed | 240<br>9 | ft/min<br>passes | x .9 | = | 24 ft/min |
|--------------------------|------------|---------------------|---|-------------|---------------------|----------|------------------|------|---|-----------|

| Time of Temp. & Speed | 8:00 AM   | 10:00 AM  | 12 Noon   | 2:00 PM   |  |
|-----------------------|-----------|-----------|-----------|-----------|--|
| Temp. in Truck        | 295°      | 290°      | 305°      | 310°      |  |
| Temp. Behind Paver    | 280°      | 270°      | 285°      | 290°      |  |
| Paver Speed           | 23 ft/min | 20 ft/min | 22 ft/min | 23 ft/min |  |

|                              |  |   |                |
|------------------------------|--|---|----------------|
| Theo. Truck Dumping Distance | (2000 lb/ton) (9 sf/sy) (12 ton/truck) | = | 104.6 ft/truck |
|                              | (114.7 lb/in/sy) (1.5 in) (12 ft)      |   |                |

| Rolling Pattern   | Daily Total Yield Check (add'l checks on reverse side)   |
|---|--|
| 4 Passes Required over each point therefore 9 Passes for Full Mat Width | <p>Theo: <math>\frac{(12 \text{ ft} \times 7860 \text{ ft}) (2.45 \times 62.4 \times .75) (1.5 \text{ in})}{(9 \text{ sf/sy})(2000 \text{ lb/ton})}</math></p> <p>= 901.2 tons required</p> <p>Delivered &amp; placed: 920.6 tons</p> <p>Yield = <math>\frac{920.6}{901.2} \times 100 = 102\%</math></p> |

[illegible]

- | Surface Variations   |                  |                  |                  |
|--|------------------|------------------|------------------|
| Tested by: <i>RS</i>   | Station/Location | Station/Location | Station/Location |
| Check one below:   |                  |                  |                  |
| <input checked="" type="checkbox"/> None found today                                     |                  |                  |                  |
| <input type="checkbox"/> Found variations & finish roller was able to correct variations |                  |                  |                  |
| <input type="checkbox"/> Found variations that require corrective action or deduction.   |                  |                  |                  |

[illegible]

| Calculations / Measurements / Misc. |  |
|-------------------------------------|--|
|                                     |  |

Date: 6/20/16  
Date: 6/22/16  
Date: 6/22/16

PAVEMENT PATCHING  
 MIX DESIGN NO 71PCC0108  
 GREENE READY MIX - CHICAGO, IL

| TICKET<br>NO. | BATCH<br>TIME                | ARRIVE<br>TIME | DEPART<br>TIME | REVS              | BATCH<br>YD <sup>3</sup> |
|---------------|------------------------------|----------------|----------------|-------------------|--------------------------|
|               |                              |                |                | INITIAL<br>/FINAL |                          |
| 83695         | 7:45 AM                      | 8:05 AM        | 8:30 AM        | 110/170           |                          |
|               | AIR ENTRAINMENT ADDED - 8 OZ |                |                |                   |                          |
| 83700         | 8:10 AM                      | 8:30 AM        | 8:45 AM        | 120/137           |                          |
| 83704         | 8:30 AM                      | 8:50 AM        | 9:10 AM        | 117/140           |                          |
| 83707         | 9:15 AM                      | 9:37 AM        | 10:05 AM       | 114/159           |                          |
| 83711         | 9:55 AM                      | 10:15 AM       | 10:45 AM       | 119/149           |                          |

## INSPECTORS:

ANNE RUIZ

STEPHEN WRIGHT

DATE: 8/18/16  
 WEATHER: SUNNY  
 77° @ 8:00 AM  
 81° @ 10:00 AM

| QC/QA      | QC/QA<br>SLUMP<br>INCHES | QC/QA<br>CONC<br>TEMP | QC/QA<br>CYLINDER<br>SERIES | STA   |
|------------|--------------------------|-----------------------|-----------------------------|-------|
| 3-8/3-5    | 2-1/2-3                  | NONE TAKEN            | NONE TAKEN                  | 37+05 |
| 4-5/4-7    | 2-8/3-2                  | 74/74                 | "                           |       |
| 5-0/4-9    | 2-6/2-8                  | NONE TAKEN            | "                           | 37+05 |
| NONE TAKEN | NONE TAKEN               | "                     | "                           | 43+50 |
| NONE TAKEN | NONE TAKEN               | "                     | "                           | 53+60 |
| 5-2/5-4    | 2-8/3-2                  | 80/80                 | P1-A / P1-C                 | 68+10 |
|            |                          |                       | P1-B / P1-D                 |       |



## Agreement on Accuracy of Plan Quantities

E-mail

Reset Form

Contract Number 61N07 District 5 Letting Date 07/04/23

Route County Champaign

Project Number Job Number

Section Number

| Quantity | Unit  | Pay Item                      | Code Number |
|----------|-------|-------------------------------|-------------|
|          | Acre  | Tree Removal Acres            | 20100500    |
| 34,960   | Cu Yd | Earth Excavation              | 20200100    |
|          | Cu Yd | Channel Excav                 | 20300100    |
|          | Cu Yd | Rock Excav Channel            | 20300200    |
|          | Cu Yd | Furnished Excavation          | 20400800    |
|          | Cu Yd | Gran Embank Spec              | 20800200    |
|          | Cu Yd | Trench Backfill               | 20800150    |
|          | Sq Yd | Compost Furnish & Place       | 211018      |
|          | Cu Yd | Topsoil Excavation & Place    | 21101505    |
|          | Acre  | Mowing                        | 25000750    |
| 11.8     | Acre  | Seeding CL 2                  | 25000       |
|          | Acre  | Mulch Method                  | 25100       |
|          | Sq Yd | Erosion Control Blanket       | 25100630    |
|          | Sq Yd | Processing Modified Soil      | 3020        |
|          | Cu Yd | Sub Gran Mat A                | 31100200    |
|          | Sq Yd | Sub Gran Mat A                | 31100       |
|          | Cu Yd | Sub Gran Mat B                | 31101100    |
|          | Sq Yd | Sub Gran Mat B                | 31101       |
|          | Cu Yd | Sub Gran Mat C                | 31102000    |
|          | Sq Yd | Sub Gran Mat C                | 31102       |
|          | Sq Yd | Stab Sub-Base 4               | 31200100    |
|          | Cu Yd | Agg Base Cse A                | 35100110    |
|          | Sq Yd | Agg Base Cse A                | 3510        |
|          | Cu Yd | Agg Base Cse B                | 35101500    |
|          | Sq Yd | Agg Base Cse B                | 3510        |
|          | Sq Yd | Proc Soil-Cem BC              | 35200       |
|          | Sq Yd | Hes PCC Bse Cse               | 3530        |
|          | Sq Yd | PCC Bse Cse                   | 35300       |
|          | Sq Yd | PCC Bse Cse 16 1/2" - 10 1/2" | 35300800    |
|          | Sq Yd | PCC Base Cse W                | 35400       |
|          | Sq Yd | Hes PCC Bse Cse W             | 3540        |
|          | Sq Yd | HMA Base Cse                  | 3550        |

| Quantity | Unit  | Pay Item                                   | Code Number |
|----------|-------|--|-------------|
| 2,464    | Sq Yd | HMA BC Wid 10                              | 35600       |
|          | Sq Yd | HMA BC Wid 8                               | 35600708    |
|          | Sq Yd | Base Cse Wid                               | 35650       |
|          | Sq Yd | Preparation of Base                        | 35800100    |
|          | Cu Yd | Agg Surf Cse A                             | 40200200    |
|          | Sq Yd | Agg Surf Cse                               | 40200       |
|          | Sq Yd | HMA Pavt FD                                | 4070        |
|          | Sq Yd | PCC Pvt                                    | 42000       |
|          | Sq Yd | Hes PCC Pvt                                | 4200        |
|          | Sq Yd | Welded Wire Reinf                          | 42000060    |
|          | Sq Yd | Protective Coat (pavement)                 | 42001300    |
|          | Sq Yd | Cont Reinf PCC Pvt                         | 42100       |
|          | Sq Yd | C R Hes PCC Pvt                            | 42100       |
|          | Sq Yd | Pavt Reinforcement                         | 42100615    |
|          | Sq Yd | Pavement Removal                           | 44000100    |
|          | Sq Yd | Driveway Pavement Removal                  | 44000200    |
|          | Cu Yd | Aggregate Shlds A                          | 48100200    |
|          | Sq Yd | Aggregate Shlds A                          | 4810        |
|          | Sq Yd | HMA Shoulders                              | 4820        |
|          | Sq Yd | PC Concrete Shoulder                       | 48300       |
|          | Cu Yd | Structure Excavation                       | 50200100    |
|          | Cu Yd | Conc Struct                                | 50300225    |
|          | Cu Yd | Conc Sup-Str                               | 50300255    |
|          | Cu Yd | Seal Coat Conc                             | 50300265    |
|          | Cu Yd | Concrete Handrail                          | 50300275    |
|          | Cu Yd | Concrete Encasement                        | 50300280    |
|          | Sq Yd | Protective Coat (structures)               | 50300300    |
|          | Sq Ft | Prec Conc Br Slab                          | 50400105    |
|          | Sq Ft | PP Conc Dk Bm DP (11", 17", 21", 27", 33") | 50400       |
|          | Ft    | F & E P P Con I-BM (36", 42", 48", 54")    | 5040        |
|          | Pound | Reinforcement Bars                         | 50800105    |
|          | Pound | Reinf Bars, Epoxy CTD                      | 50800205    |
|          | Sq Yd | Slope Wall                                 | 51100       |
|          | Cu Yd | Conc Box Cul                               | 54003000    |
|          | Sq Ft | Membrane Waterproof                        | 58000100    |

(and the following items, as permitted by the Standard Specifications or contract provisions):

| Quantity         | Unit             | Pay Item                                 | Code Number         |
|------------------|------------------|--|---------------------|
| <del>383.5</del> | <del>Cu Yd</del> | <del>Conc Strut</del> <i>GJR 7/10/23</i> | <del>50300225</del> |

We hereby agree that when the project is constructed essentially to the lines, grades and dimensions shown on the plans, no further measurement will be required for the above items and payment will be made for the quantities shown in the contract except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as specified.

## PLAN QUANTITY CHECK



**EXAMPLE**

20200100 EARTH EXCAVATION, PLAN = 34,960 CY

- SPOT CHECKED EXISTING GRADES. SEE FB #1 FOR X-SECTIONS.
- PLAN X-SECTIONS VISUALLY COMPARED TO EXISTING GROUND  
⇒ NO SIGN OF RECENT CONSTRUCTION
- DESIGN END-AREA VOLUME CALCS WERE CHECKED

NOTE: UNDERCUT VOLUMES AND LOCATIONS ARE DESIGNATED ON THE PLANS AND WILL BE FINAL MEAS. BY BEFORE & AFTER X-SECS.

∴ ACCEPT PLAN QTY.

25000200 SEEDING CL 2, PLAN = 11.8 ACRE

- STA 1034+20 TO 1108+12 = 7,392 FT., WIDTH = 34 FT.
- SEEDING AREA =  $\frac{7,392 \text{ ft.} \times 34 \text{ ft.}}{43,560 \text{ sf / acre}} \times 2 \text{ sides} = 11.5 \text{ acres}$
- DIFFERENCE = 0.3 ACRE. ROUGH CALC NOT INCLUDED GROUND SLOPE.

∴ ACCEPT PLAN QTY.

35600716 BIT CONC BC WID 10, PLAN = 2,464 SY

PLAN WIDTH = 1.5'

AREA = 2 sides × 1.5' × 7,393' × 1/9 = 2,464 SY ∴ ACCEPT PLAN QTY.

50300225 CONC STRUCT, PLAN = 383.5 CY

CALC. QTY = 378.1 CY (SEE CALC FILE #4)

DIFFERENCE = 5.4 CY @ \$425/CY = \$2,295 ∴ NOT OK

→ CONTRACTOR NOTIFIED BY LETTER ON 9-7-16

CALC BY: BC 9-7-16



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 9-21-16

Contractor or Sub. Careful Const.

Weather Hot-Humid 90's

Initial(s)

Date

Inspected by: JCS 9-21-16

Measured by: JCS 9-21-16

Calculated by: JCS 9-21-16

Checked by: DEM 9-22-16

| Item Code # | Fund Code (Opt.) | Item         | Location    | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|--------------|-------------|--------------------|--|------------------|
| 20200100    | -----            | Earth Excav. | 16 + 20 Lt. | 1709.8CY           | N/A  | √                |
|             |                  |              |             |                    |  |                  |
|             |                  |              |             |                    |  |                  |
|             |                  |              |             |                    |  |                  |
|             |                  |              |             |                    |  |                  |
|             |                  |              |             |                    |  |                  |

This is: ☒ an estimated progress measurement (item no.: 20200100 )

☐ a final field measurement (item no.: \_\_\_\_\_ )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Trailer –  $(6.9\text{ft} \times 23.0\text{ft} \times 3.6\text{ft})/27 = 21.2\text{CY}$

Tandem –  $(6.9\text{ft} \times 14.4\text{ft} \times 3.6\text{ft})/27 = 13.2\text{CY}$

80 loads (tandem)  $\times 13.2\text{CY} \times 80\% = 844.8\text{CY}$

51 loads (trailer)  $\times 21.2\text{CY} \times 80\% = \underline{865.0\text{CY}}$

Total 1709.8CY



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 7-26-16

Contractor or Sub. ACME Construction

Weather Clear, 90°

Initial(s)

Date

Inspected by: RG

7-26-16

Measured by: RG

7-26-16

Calculated by: RG

7-26-16

Checked by: mf

7/27/16

| Item Code # | Fund Code (Opt.) | Item             | Location          | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|------------------|-------------------|--------------------|--|------------------|
| 20200100    |                  | Earth Excavation | 2 + 60 to 17 + 00 | 8372 CY            | N/A  | √                |
|             |                  |                  |                   |                    |  |                  |
|             |                  |                  |                   |                    |  |                  |
|             |                  |                  |                   |                    |  |                  |
|             |                  |                  |                   |                    |  |                  |
|             |                  |                  |                   |                    |  |                  |

This is: ☒ an estimated progress measurement (item no.: 20200100 )

☐ a final field measurement (item no.: \_\_\_\_\_ )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

By Count: 490 Loads hauled, 70 Loads each

Equipment: 4 Terex's (TR45) & 3 Cats (621G)

TR45: 4 x 70 Loads x 25.6 CY/Load x 80% = 5734 CY

621G: 3 x 70 Loads x 15.7 CY/Loads x 80% = 2638CY

Total = 8372 CY





# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 8-9-16

Contractor or Sub. Tonka Construction

Weather Sunny 80°

Initial(s)

Date

Inspected by: TB LAG

8-9-16

Measured by: \_\_\_\_\_

Calculated by: TB

8-9-16

Checked by: AG

8/12/16

| Item Code # | Fund Code (Opt.) | Item            | Location               | Quantity and Units   | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|-----------------|------------------------|--|--|------------------|
| 20700220    |                  | POROUS GRANULAR | STA 124+20 → 126+10 RT | 92.3 CY  | Approved Source & Tickets                  | ✓                |
|             |                  | EMBANKMENT      | 128+70 → 129+50 RT     |  |  |                  |
|             |                  |                 |                        |  |  |                  |
|             |                  |                 |                        | Note: Final payment for PGE must be based on before and after measurements and calculations. |  |                  |
|             |                  |                 |                        |  |  |                  |
|             |                  |                 |                        |  |  |                  |

This is: ☒ an estimated progress measurement (item no.: 20700220 )

☐ a final field measurement (item no.: \_\_\_\_\_ )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

20700220

PGE DELIVERED - FROM TICKETS: 153.8 TONS

CONVERSION FACTOR: 1.5 TON/CY (FROM MISTIC PAY ITEM/ MATERIAL CONV. FACTOR REPORT)

PAY 90% FOR ESTIMATED

$(153.8 \text{ T} / 1.5 \text{ T/CY}) \times 0.90 = 92.3 \text{ CY}$



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 7-26-16

Contractor or Sub. No Joke Supply Co.

Weather Hot, Humid, Hazy

Initial(s) \_\_\_\_\_ Date \_\_\_\_\_  
 Inspected by: JCS 7/26/16  
 Measured by: \_\_\_\_\_  
 Calculated by: JCS 7/26/16  
 Checked by: RLS 7/28/16

| Item Code # | Fund Code (Opt.) | Item                | Location     | Quantity and Units                                 | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|---------------------|--------------|--|--|------------------|
| 50800105    |                  | Rebar               | Sta. 15 + 53 | <del>5886 lb</del><br><i>RLS</i><br><i>5851 lb</i> | List + Cert + Mark                         | ✓                |
|             |                  |                     |              |  |  |                  |
|             |                  |                     |              |  |  |                  |
| 50300225    |                  | Concrete Structures | Sta. 15 + 53 | 38.7 CY  | Daily Plant Reports + Tickets + Test       | ✓                |
|             |                  |                     |              |  |  |                  |
|             |                  |                     |              |  |  |                  |

This is: ☒ an estimated progress measurement (item no.: 50800105, 50300225 )

☐ a final field measurement (item no.: \_\_\_\_\_ )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Conc. Struct. – 43 CY delivered x 90% = 38.7 CY ✓

Rebar Factor –  $\frac{60,770 \text{ lb}}{402 \text{ CY}} = 151.2 \text{ lb/cy}$  ✓

38.7 CY x 151.2 lb/CY = ~~5886 lb~~  
*RLS*  
*5851 lb*

**Note: 60,770 lbs of rebar and 402 CY of concrete are the plan quantities for this structure taken from the Bill of Materials shown on the plans.**



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 9-27-16

Contractor or Sub. SUPERIOR

Weather HOT-HUMID 90's

Initial(s)

Date

Inspected by:

GEB

9-27-16

Measured by:

GEB

9-27-16

Calculated by:

GEB

9-27-16

Checked by:

RLS

9-27-16

| Item Code # | Fund Code (Opt.) | Item             | Location         | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|------------------|------------------|--------------------|--|------------------|
| 55019500    |                  | SS 1 RCP CL 4 12 | STA 9+00 TO 9+50 | 45.0 ft.           | List & Mark; (Conc. Structures Inc.)       | ✓                |
|             |                  |                  |                  |                    |  |                  |
|             |                  |                  |                  |                    |  |                  |
|             |                  |                  |                  |                    |  |                  |
|             |                  |                  |                  |                    |  |                  |
|             |                  |                  |                  |                    |  |                  |

This is: ☒ an estimated progress measurement (item no.: 55019500 )

☐ a final field measurement (item no.: \_\_\_\_\_ )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

7.5 ft per section x 6 sections= 45.0 ft

70100460 TRAF CONT & PROT 701306

|          |                |          | PAY<br>THIS<br>DATE | TOTAL<br>TO<br>DATE |
|----------|----------------|----------|---------------------|---------------------|
| DATE     |                |          |                     |                     |
| 9/20/16  | INITIAL SETUP  |          | 0.25                | 0.25                |
| 10/7/16  | 18 DAYS        | x 0.65 = | 0.12                | 0.37                |
|          | 100 DAYS       |          |                     |                     |
| 11/4/16  | 28 DAYS        | x 0.65 = | 0.18                | 0.55                |
|          | 100 DAYS       |          |                     |                     |
| 12/2/16  | 28 DAYS        | x 0.65 = | 0.18                | 0.73                |
|          | 100 DAYS       |          |                     |                     |
| 12/15/16 | ALL TC REMOVED |          | 0.27                | 1.00                |
|          | PAY BALANCE    |          |                     |                     |

**NOTE:** The final entry shown includes both the remainder of the prorated 65% ( $0.65 - 0.12 - 0.18 - 0.18 = 0.17$ ) and the final 10% for the removal of the traffic control.

PG. 3

| CALC'D                                  |          | CHCK'D |          |        |
|---|----------|--------|----------|--------|
| BY                                      | DATE     | BY     | DATE     | D.Q. # |
| MRM                                     | 9/20/16  | JGL    | 9/20/16  | 2      |
| "                                       | 10/7/16  | "      | 10/7/16  | 29     |
| "                                       | 11/4/16  | FCM    | 11/3/16  | 104    |
| "                                       | 12/2/16  | JGL    | 12/2/16  | 223    |
| "                                       | 12/15/16 | FCM    | 12/15/16 | 247    |
| ALL SIGNS & BARRICADES CONFORM TO SPECS |          |        |          |        |



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date July 18, 2016

Contractor or Sub. ACME Const. Co.

Weather Sunny Low 70's

Initial(s) \_\_\_\_\_ Date \_\_\_\_\_  
 Inspected by: JMS 7-18-16  
 Measured by: JMS & TER 7-18-16  
 Calculated by: TER 7-18-16  
 Checked by: MBA 7-19-16

| Item Code # | Fund Code (Opt.) | Item                  | Location          | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|-----------------------|-------------------|--------------------|--|------------------|
| 21101505    |                  | Top Soil Exc. & Place | Sta. 2+50 TO 7+00 | 1449.1 C.Y.        | None, topsoil taken from Within R.O.W.     |                  |
|             |                  |                       |                   |                    |  |                  |
|             |                  |                       |                   |                    |  |                  |
|             |                  |                       |                   |                    |  |                  |
|             |                  |                       |                   |                    |  |                  |
|             |                  |                       |                   |                    |  |                  |

This is: ☒ an estimated progress measurement (item no.: 21101505)

☐ a final field measurement (item no.: \_\_\_\_\_)

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

### End Areas

1.)  $80' \times 1.5' = 120 \text{ S.F.}$

2.)  $85' \times 2.0' = 170 \text{ S.F.}$

3.)  $125' \times 2.0' = 250 \text{ S.F.}$

### Volumes

$V_1 = \frac{120+170}{2} \times 250' = 36,250 \text{ C.F.}$

$V_2 = \frac{170+250}{2} \times 200' = 42,000 \text{ C.F.}$

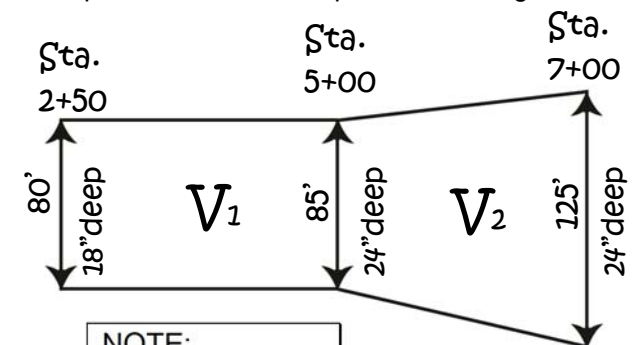
$36,250 \text{ C.F.}$

$+42,000 \text{ C.F.}$

$78,250 \text{ C.F.} \div 27 = 2898.1 \text{ C.Y.}$

$2898.1 \text{ C.Y.} \times 0.50 = 1449.1 \text{ C.Y.}$

Will pay remaining 50% upon placement of topsoil later.



NOTE:  
 Stockpiled @  
 STA. 2+00 80'L  
 STA. 6+00 80'R

|   |  |       |       |        |                        |       |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
|---|--|-------|-------|--------|------------------------|-------|--------|-----------------|----------------------------|---------------------------|-------|--------|---------------|------------|---------------------|---------------------|------|-------|--------|----------|------------|-------------|-----|---------|
| <b>Pay Code</b>   | <b>Pay Item</b>  |       |       |        |                        |       |        | <b>Plan QTY</b> |                            | <b>Units</b>              |       |        |               | County:    | WILLIAMSON          |                     |      |       |        |          |            |             |     |         |
| 44200970  | CLASS B PATCHES, TYPE II, 10 INCH  |       |       |        |                        |       |        | 260.0           |                            | sy                        |       |        |               | Section:   | (X1-4)81 Lake Creek |                     |      |       |        |          |            |             |     |         |
| 44213200  | SAW CUTS   |       |       |        |                        |       |        | 1470.0          |                            | ft                        |       |        |               | Route:     | FAI RTE 57          |                     |      |       |        |          |            |             |     |         |
|   |  |       |       |        |                        |       |        |                 |                            |                           |       |        |               | District:  | 9                   |                     |      |       |        |          |            |             |     |         |
| <b>Thickness</b>  | 10 inches  |       |       |        |                        |       |        |                 |                            |                           |       |        |               | Contract:  | 98634               |                     |      |       |        |          |            |             |     |         |
| <b>Notes:</b>   |  |       |       |        |                        |       |        |                 |                            |                           |       |        |               | Job No:    | C-99-088-06         |                     |      |       |        |          |            |             |     |         |
|   |  |       |       |        |                        |       |        |                 |                            |                           |       |        |               | Project:   |                     |                     |      |       |        |          |            |             |     |         |
| (1)   | I57: RL - Ramp Lane, PL - Passing Lane, DL - Driving Lane, SB - South bound, NB - North Bound  |       |       |        |                        |       |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| (2)   | Average Depth: Pav't is the meas. depth of the exist. pav't, qty used for calculating % change. Patch is the meas. depth of the actual patch if contractor undercuts existing pav't without cause. |       |       |        |                        |       |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| (3)   | The product of the smallest width & length of original or final measurements.  |       |       |        |                        |       |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| <b>(See Patching field book for this contract for all original measurements.)</b> |  |       |       |        |                        |       |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| <b>Original Measurements</b>  |  |       |       |        |                        |       |        |                 |                            | <b>Final Measurements</b> |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| (1) Lane  | Sta  | Patch | Width | Length | Marked Quantities (sy) |       |        |                 | (2) Average Depth (inches) | % Change in Thickness     | Width | Length | (3) Min. Area | Quan. Adj. | Final Area          | Pay Quantities (sy) |      |       |        | Saw Cuts | Dowel Bars | Final Meas. |     |         |
|   |  | #     | (ft)  | (ft)   | TY I                   | TY II | TY III | TY IV           | Pav't                      | Patch                     | %     | (ft)   | (ft)          | (sy)       | (%)                 | (sy)                | TY I | TY II | TY III | TY IV    | (ft)       | (ea)        | By  | Date    |
| <b>Northbound Lanes</b>   |  |       |       |        |                        |       |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 193+35   | 17    | 9.0   | 12.0   |                        | 12.0  |        |                 | 15.00                      | 15.00                     | 50.0  | 9.1    | 12.0          | 12.0       | 0.20                | 14.4                |      | 14.4  |        |          | 54         | 20          | BWC | 7/12/07 |
| NBPL  | 192+33   | 18    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 189+80   | 19    | 8.0   | 12.0   |                        | 10.7  |        |                 | 16.00                      | 16.00                     | 60.0  | 8.2    | 12.0          | 10.7       | 0.20                | 12.8                |      | 12.8  |        |          | 52         | 20          | BWC | 7/12/07 |
| NBDL  | 188+80   | 20    | 7.0   | 12.0   |                        | 9.3   |        |                 | 16.00                      | 16.00                     | 60.0  | 7.0    | 12.0          | 9.3        | 0.20                | 11.2                |      | 11.2  |        |          | 50         | 20          | BWC | 7/12/07 |
| NBDL  | 187+80   | 21    | 6.0   | 12.0   |                        | 8.0   |        |                 | 16.00                      | 16.00                     | 60.0  | 6.0    | 12.0          | 8.0        | 0.20                | 9.6                 |      | 9.6   |        |          | 48         | 20          | BWC | 7/12/07 |
| NBPL  | 187+80   | 22    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 187+15   | 23    | 6.0   | 12.0   |                        | 8.0   |        |                 | 16.00                      | 16.00                     | 60.0  | 6.1    | 12.0          | 8.0        | 0.20                | 9.6                 |      | 9.6   |        |          | 48         | 20          | DHR | 7/12/07 |
| NBPL  | 187+15   | 24    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 185+75   | 25    | 6.0   | 12.0   |                        | 8.0   |        |                 | 16.00                      | 16.00                     | 60.0  | 6.1    | 12.0          | 8.0        | 0.20                | 9.6                 |      | 9.6   |        |          | 48         | 20          | DHR | 7/12/07 |
| NBPL  | 185+75   | 26    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 185+38   | 27    | 6.0   | 12.0   |                        | 8.0   |        |                 | 16.00                      | 16.00                     | 60.0  | 6.1    | 12.0          | 8.0        | 0.20                | 9.6                 |      | 9.6   |        |          | 48         | 20          | DHR | 7/12/07 |
| NBPL  | 185+38   | 28    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 182+80   | 29    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 182+80   | 30    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 181+80   | 31    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 181+80   | 32    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 181+28   | 33    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 177+15   | 34    | 9.0   | 12.0   |                        | 12.0  |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 176+21   | 35    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 175+15   | 36    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 175+15   | 37    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 174+20   | 38    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 174+20   | 39    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 173+58   | 40    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 173+58   | 41    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 172+85   | 42    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 172+25   | 43    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 171+25   | 44    | 9.0   | 12.0   |                        | 12.0  |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 171+25   | 45    | 9.0   | 12.0   |                        | 12.0  |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBDL  | 170+20   | 46    | 9.0   | 12.0   |                        | 12.0  |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| NBPL  | 170+20   | 47    | 6.0   | 12.0   |                        | 8.0   |        |                 |                            |                           |       |        |               |            |                     |                     |      |       |        |          |            |             |     |         |
| <b>Totals</b>   |  |       |       |        | 0                      | 272   | 0      | 0               |                            |                           |       |        |               | 64.00      |                     | 76.80               | 0    | 77    | 0      | 0        | 348        | 140         |     |         |
|   |  |       |       |        | 272                    |       |        |                 |                            |                           |       |        |               |            |                     |                     | 77   |       |        |          |            |             |     |         |

**FOR EXAMPLE ONLY!**

The Department does not provide, nor approve, any electronic spreadsheets. It is the responsibility of the Resident to ensure the accuracy of any spreadsheet he/she chooses to use, including any formulas that may be embedded in the spreadsheet. NEVER use any spreadsheet that you have not checked for accuracy.

## Contract 62764 – Hicks Rd

### 50800105 Reinforcement Bars

| Bar | Bar Size | No. of Bars In Place | Length (ft-in) | Length (ft) | lb/ft * | lb    | Subtotals (lb) |
|-----|----------|----------------------|----------------|-------------|---------|-------|----------------|
| a   | 9        | 64                   | ✓ 16 ft 3 in   | 16.25       | 3.400   | 55.25 | 3536.00 lb     |
| a1  | 9        | 64                   | ✓ 6 ft 6 in    | 6.5         | 3.400   | 22.10 | 1414.40 lb     |
| a2  | 9        | 32                   | ✓ 12 ft 9 in   | 12.75       | 3.400   | 43.35 | 1387.20 lb     |
| h   | 7        | 70                   | ✓ 6 ft 8 in    | 6.67        | 2.044   | 13.63 | 954.34 lb      |
| h1  | 7        | 28                   | ✓ 6 ft 8 in    | 6.67        | 2.044   | 13.63 | 381.74 lb      |
| h2  | 6        | 36                   | ✓ 5 ft 9 in    | 5.75        | 1.502   | 8.64  | 310.91 lb      |
| h3  | 6        | 10                   | ✓ 8 ft 9 in    | 8.75        | 1.502   | 13.14 | 131.43 lb      |
| h4  | 5        | 204                  | ✓ 3 ft 6 in    | 3.5         | 1.043   | 3.65  | 744.70 lb      |
| v   | 7        | 21                   | ✓ 10 ft 0 in   | 10          | 2.044   | 20.44 | 429.24 lb      |
| v1  | 7        | 12                   | ✓ 8 ft 6 in    | 8.5         | 2.044   | 17.37 | 208.49 lb      |
| x   | 6        | 4                    | ✓ 3 ft 9 in    | 3.75        | 1.502   | 5.63  | 22.53 lb       |

\* per table (Art 508.07)

**Total = 9520.98 lb**

Total Weight of Rebar = 9520.98 lb

Theoretical Volume of Concrete = 31.0 cy  
(See Calc file 54003000 Concrete Box Culvert)

Rebar/Concrete factor 9520.98lb / 31.0 cy = 307.1 lb/cy

#### Example Calculation

for a bar

Length x lb/ft = lb      16.25 ft x 3.4 lb = 55.25 lb

no. of bars x lb = subtotals (lb)      64 x 55.25 lb = 3536.00 lb

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|              | Initials | Date       |
|--------------|----------|------------|
| Prepared by: | BCA      | 10/10/16   |
| Checked by:  | MRL      | 10/10/2016 |

## Material Allowance Affidavit

|                 |            |              |
|-----------------|------------|--------------|
| Contract Number | District   | Letting Date |
| 94270           | 7          | 07/10/23     |
| Route           | County     |              |
| FAI 57          | Jefferson  |              |
| Project Number  | Job Number |              |
|                 |            |              |
| Section Number  |            |              |
|                 |            |              |

| Itemized Material Statement |          |            |             |
|-----------------------------|----------|------------|-------------|
| Item of Material            | Quantity | Unit Cost  | Amount      |
| 1. Mast Arms                | 8        | \$2,640.00 | \$21,120.00 |

Subtotal \$21,120.00

Freight on Material \$702.47

Total \$21,822.47

I hereby certify that the above material has been received and properly stored.

|                      |      |
|----------------------|------|
| Resident's Signature | Date |
|                      |      |

### AFFIDAVIT

John Smith being first duly sworn, deposes and says that he is the duly authorized representative of the Quality Contracting, Inc.

Company and as such has authority to make the following statement:  
I hereby, certify that the material herein mentioned has been received and stored in a manner satisfactory to a representative of the Department of Transportation. Further, that said material is to be used for the purposes of constructing the Contract captioned above.

I further certify that the within statement is true and correct and that the purpose of this affidavit is to obtain payment for material in storage.

|                      |      |            |
|----------------------|------|------------|
| Contractor Signature | Date | By         |
|                      |      | John Smith |

### Notary Public

State of Illinois

County Jefferson

Signed (or subscribed or attested) before me on Monday, July 10, 2023 by  
(date)

John Smith  
(name/s of person/s)

**"OFFICIAL SEAL"**  
**MARY JONES**  
**Notary Public, State of Illinois My**  
**Commission Expires 07/10/23**

Signature of Notary Public

|  |
|--|
|  |
|--|

My commission expires 07/10/23







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Item 40603310

HMA SC "C" N50

Fund 33DC01

Plan Quantity 3397.000

Unit Measure TON

Contract Unit Price 77.08

**Authorizations**

| Number | Date App'vd | Add  | Deduct | Total   |
|--------|-------------|------|--------|---------|
| 8      | 10/13/16    | 25.0 |        | 3,422.0 |
|        |             |      |        |         |
|        |             |      |        |         |
|        |             |      |        |         |
|        |             |      |        |         |
|        |             |      |        |         |

Cnty Const Sfty

177 I000 2A

Quantity

3397.000

| Date    | Station to Station<br>Location or Description   | Quantities Placed |         |         | Evidence of<br>Material Inspection   | Progress<br>Document Source |
|---------|---|-------------------|---------|---------|--------------------------------------|-----------------------------|
|         |   | This Date         | To Date | Pay Est |                                      |                             |
|         | Per Art. 406.13, the Adjusted Plan Quantity is as follows →                           |                   |         |         |                                      |                             |
|         | Avg. Bulk Specific Gravity from the approved mix design (little d) = 2.34             |                   |         |         |                                      |                             |
|         | $\frac{2.34 \times 46.8}{112} \frac{G_{mb} \times 46.8}{U} C = \quad = \quad = 0.978$ |                   |         |         |                                      |                             |
|         | Adj Plan Qty = 0.978(3,397) = 3,322.3 tons  |                   |         |         |                                      |                             |
|         |   |                   |         |         |                                      |                             |
| 9/5/16  | STA 62+03 → 118+27 NB   | 865.8             | 865.8   |         | Daily Plant Rpt.<br>✦ Tickets ✦ Test | Tickets                     |
| 9/6/16  | STA 118+27 → 175+79 NB  | 885.5             | 1,751.3 |         | “ “                                  |                             |
| 9/7/16  | STA 175+19 → 119+27 SB  | 861.0             | 2,612.3 |         | “ “                                  |                             |
| 9/8/16  | STA 119+29 → 62+03 SB   | 872.7             | 3,485.0 | #5/3397 | “ “                                  |                             |
| 9/12/16 | Deduct for Max Pay  | -63.0             | 3,422.0 | #6      |                                      |                             |
|         |   |                   | FINAL   |         |                                      |                             |
|         |   |                   |         |         |                                      |                             |
|         | Max. Pay = 3,322.3 tons × 1.03 = 3,422.0 tons → Deduct Pay Qty                        |                   |         |         |                                      |                             |
|         | Quan. Placed 3,485.0 – Max. Pay 3,422.0 = Deduct 63.0                                 |                   |         |         |                                      |                             |
|         | The surface was checked and no variations found. See FB #3, p. 35.                    |                   |         |         |                                      |                             |
|         |   |                   |         |         |                                      |                             |

Source of documentation

for final quantity: **Tickets**

For all tonnage items  
weighed on platform scales:  
Scales checked by  
Dept. Of Agriculture  
Date on decal 2016  
Identification No. 074346  
Scale Location General  
Plant 1, Rock Falls

## Inspection Reports

[illegible]



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 9-22-16

Contractor or Sub. B & M Constr.

Weather Sun, 80°

|                |                    |                |
|----------------|--------------------|----------------|
|                | Initial(s)         | Date           |
| Inspected by:  | <u>JS</u>          | <u>9-22-16</u> |
| Measured by:   | <u>JS &amp; DF</u> | <u>9-22-16</u> |
| Calculated by: | <u>JS</u>          | <u>9-22-16</u> |
| Checked by:    | <u>DF</u>          | <u>9-28-16</u> |

| Item Code # | Fund Code (Opt.) | Item                | Location | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|---------------------|----------|--------------------|--|------------------|
| 42400100    | 07Auo1           | PC Conc. Sidewalk 4 | RT 0+00- | 2,500.0            | Plant Report & Tickets & Test              | √                |
|             |                  |                     | RT 5+00  | SF                 |  |                  |
|             |                  |                     |          |                    |  |                  |
|             |                  |                     |          |                    |  |                  |
|             |                  |                     |          |                    |  |                  |
|             |                  |                     |          |                    |  |                  |

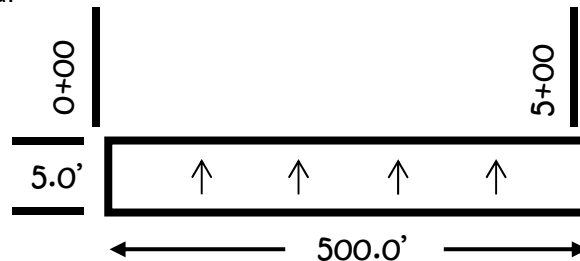
This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 42400100 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

### Depth Checks

STA 0+00 = 4.05"  
 1+00 = 4.10"  
 2+00 = 4.10"  
 3+00 = 4.05"  
 4+00 = 4.00"  
 5+00 = 5.00"



$$5.0' \times 500.0' = 2,500.0 \text{ SF}$$

### Cross-Slope Checks↑

STA 0+00 = 1.9%  
 1+00 = 2.0%  
 2+00 = 1.9%  
 3+00 = 1.9%  
 4+00 = 1.9%  
 5+00 = 2.0%



## Truck Tare Weights

Print Form

Reset Form



|  |                          |                     |                          |
|--|--------------------------|---------------------|--------------------------|
| Date<br>07/10/23                         | Contract Number<br>90210 | District<br>5       | Letting Date<br>07/10/23 |
| Contractor<br>Trusty Hauling             | Route<br>FAI 57          | County<br>Champaign |                          |
| Scale Location<br>Gravel Group - Rantoul | Project Number           | Job Number          |                          |
| Material<br>CA-6                         | Section Number           |                     |                          |

| Truck or License Number | Name on Truck | Tare Weight | Driver in Truck?  |
|-------------------------|---------------|-------------|---|
| 1. 19                   | Peters        | 20,000.0000 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 2. 44                   | Peters        | 20,500.0000 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 3. 21                   | Peters        | 20,800.0000 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 4. 22                   | Peters        | 21,000.0000 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 5. 43                   | Peters        | 20,000.0000 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 6. 40                   | Peters        |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 7.                      |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 8.                      |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 9.                      |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 10.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 11.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 12.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 13.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 14.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 15.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 16.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 17.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 18.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 19.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| 20.                     |               |             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |

Add

Note: Tare weights of trucks hauling material to Department of Transportation projects must be established daily when pay quantities are determined by platform scale weights.

Department of Agriculture scale certification information:

|                           |                          |
|---------------------------|--------------------------|
| Date<br>07/10/23          | Inspector<br>Paul Kliner |
| Certificate No.<br>35044  |                          |
| Resident<br>Earl T. Jones |                          |



E-mail

Reset Form

Instructions: At random, select a loaded truck and obtain a loaded weight on an independent scale. Allow the truck to unload. Then obtain an empty weight. For additional information see BIC Independent Weight Check Manual.  
**ALL FIELDS MUST BE COMPLETED AND ALL WEIGHT TICKETS SUBMITTED WITH FORM.**

☐ Aggregate ☒ HMA ☐ Salt

**Ticket Information**

District **5**

Maintenance Yard **N/A**

Supplier Code/Name/City **3916-03, CROSS CONST. CO., RANTOUL**

Loaded Weight (Gross)\* **73,260**

Local Ticket Number **047488**

Empty Weight (Tare)\* **28,180**

Local Ticket Weight (Net) **45,080**

**Additional Comments**

Scale Decal No. 006151, Decal Year 2016. Contract 90939

**Independent Scale Information**

Loaded Weight (Gross) **73,260**

Company Name **Bunge(Dump 2)Danville**

Empty Weight (Tare) **28,080**

City **Danville**

Calculated Net Weight **45,180**

Trucking Co **Gilbert**

Truck ID **456**

Weight Tolerance % **-0.22%**

Aggregate HMA Salt

Weight Tolerance lbs **-100**

Tolerance: 0.7% 0.5% 600 lbs

(Ticket Weight - Ind. Wt. Ck. Net Weight) / Ind. Wt. Ck. Net Wt. x 100

Weight Check Performed By

**Matt A. Young**

Weight Check Performed on Date

**09/27/16**

Use the "Attach Files" button below, attach scale tickets and supporting documentation.

Attach Files

☒ An Independent Weight Check was performed today and passed.

☐ An Independent Weight Check was performed today and failed.

- Within 24 hours, email this completed IWC Form with the subject line "IWC OOT".
- Within seven (7) calendar days, email completed OOT Action Report, BIC 7001, to DOT.ITWC@illinois.gov.

Use the "Save As" button below, name the completed form with the supplier code and date the Independent Weight Check was performed (ex. 12345-03\_040125.pdf).

Save As

Upon completion click the "E-mail" button above.

Please cc: Appropriate District Staff / Contractor. If you have any questions or need any assistance, please contact your Construction Quality Engineer. Thank you in advance for your cooperation.

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# **Ticket Tape Example, Aggregate Base Course, Type A (English)**

|                        |                                   |
|------------------------|-----------------------------------|
| <b>8-8-16</b>          |                                   |
| <b>35100100</b>        |                                   |
| <b>AGG BASE CSE A</b>  |                                   |
| <b>STA 1+20</b>        | 0. C                              |
| <b>to 19+00</b>        |                                   |
|                        | 24,300. +                         |
| <b>Contract 90002</b>  | 23,700. +                         |
|                        | 22,300. +                         |
|                        | 24,700. +                         |
|                        | 23,500. +                         |
|                        | 22,900. +                         |
|                        | 25,500. +                         |
|                        | 23,700. +                         |
|                        | 23,800. +                         |
|                        | 22,800. +                         |
|                        | 24,000. +                         |
|                        | 23,100. +                         |
|                        | 23,600. +                         |
|                        | 24,100. +                         |
|                        | 23,800. +                         |
|                        | 24,300. +                         |
|                        | 23,400. +                         |
|                        | 24,300. +                         |
|                        | 22,800. +                         |
|                        | 25,600. +                         |
|                        | 23,200. +                         |
|                        | 24,000. +                         |
|                        | 23,900. +                         |
|                        | 547,300 *                         |
|                        | <b>LBS</b>                        |
|                        | 547,300. ÷                        |
|                        | 2,000 =                           |
|                        | 273.65 *                          |
|                        | <b>tons</b>                       |
| <b>Actual Moisture</b> | = <u>220.9 - 206.1</u> =          |
|                        | <b>206.1</b>                      |
|                        | <b>= 0.072</b>                    |
| <b>Pay Wt.</b>         | = <u>273.65 x 1.06</u>            |
|                        | <b>1.072</b>                      |
|                        | = <u><b>270.6</b></u> <b>TONS</b> |

Calc by: JWS 8-8-16  
Check by: RH 8-9-16

NOTE: Refer to Small Quantities provision in Section A of doc guide. No moisture correction required if less than 500 tons per day, however IDOT reserves right to perform moisture correction on any amounts delivered.

This is an example of the documentation requirement for granular pay items paid on a tonnage basis.

This adding machine tape is to be securely bound around the truck tickets for each pay item for each day.



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 7-20-16

Contractor or Sub. ACME Construction

Weather Cloudy, 82°

Initial(s) KWH Date 7-20-16  
 Inspected by: KWH  
 Measured by: KWH  
 Calculated by: KWH Date 7-20-16  
 Checked by: SM Date 7-22-16

| Item Code # | Fund Code (Opt.) | Item                          | Location              | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|-------------------------------|-----------------------|--------------------|--|------------------|
| 25000700    |                  | Agricultural Ground Limestone | Entire Job (20 acres) | 83.5 tons          | Tickets from approved aggregate source     | ✓                |
|             |                  |                               |                       |                    | List – Charleston Stone Co. @              |                  |
|             |                  |                               |                       |                    | Charleston, IL (Coles County)              |                  |
|             |                  |                               |                       |                    | West Pit, see wt. tickets in               |                  |
|             |                  |                               |                       |                    | File #6 (list & tick)                      |                  |
|             |                  |                               |                       |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 25000700 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Plans require 4 Tons/acre to be applied to 20 acres

From "Agricultural Limestone Booklet" at <http://www.idot.illinois.gov/Assets/uploads/files/Doing-Business/Specialty-Lists/Highways/Materials/Materials-&Physical-Research/Aggregate/2016LimestoneBook.pdf> ,

The 4 year conversion factor = 0.85

Total tons required = 4 T/acre x 20 acres x 0.85 = 68.0 Tons

Actual tons delivered = 71.0 Tons (see Tickets)

Pay Qty. = 71.0 tons ÷ 0.85 = 83.5 tons (Max Pay 80 tons x 1.08 = 86.4 Tons)



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 9-13-16

Contractor or Sub. Interstate Landscaping

Weather Sunny, 81°

Initial(s) \_\_\_\_\_  
 Inspected by: KWH, SM  
 Measured by: KWH, SM  
 Calculated by: KWH  
 Checked by: SM

Date \_\_\_\_\_  
9-13-16  
9-13-16  
9-13-16  
9-19-16

| Item Code #              | Fund Code (Opt.) | Item                 | Location               | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|--------------------------|------------------|----------------------|------------------------|--------------------|--|------------------|
| 25000200                 |                  | Seeding, Class 2     | STA. 1 +00 TO          | 4.5 ACRE           | Certificate of Seed Analysis From          |                  |
|                          |                  |                      | 19 + 00 LT.            |                    | Registered Seed Technologist               |                  |
| 25100105                 |                  | Mulch Method 1       | “ “                    | 4.5 ACRE           | Straw – Visual                             |                  |
| <b>Application Rates</b> | Seed             | 675 lb. Delivered →  | Rate = 900LB/4.5AC=200 | LB/ACRE ✓          |  |                  |
|                          | Straw            | 9.0 Tons Delivered → | Rate = 9.0T/4.5 AC = 2 | Ton/Acre ✓         |  |                  |
|                          |                  |                      |                        |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 25000200, 25100105 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

$$\frac{1}{2} (109.6 + 112.4) \times 646.7 = 71,783.7 \text{ s.f.}$$

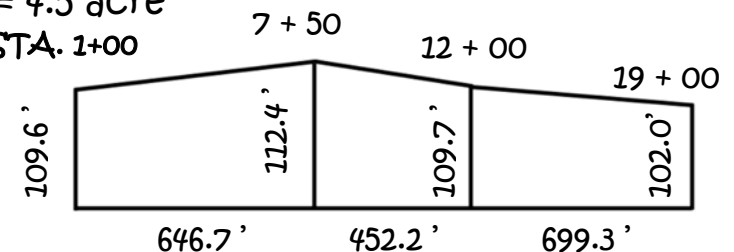
$$\frac{1}{2} (112.4 + 109.7) \times 452.2 = 50,216.8$$

$$\frac{1}{2} (109.7 + 102.0) \times 699.3 = \underline{74,020.9}$$

196,021.4 s.f.

$$196,021.4 \text{ s.f.} \times \frac{1 \text{ acre}}{43,560 \text{ sf}} = 4.5 \text{ acre}$$

**NOTE: All Measurements Taken on Slope!**



**Traffic Control Surveillance Report**
[Print Form](#)
[Reset Form](#)


|                          |                 |          |
|--------------------------|-----------------|----------|
| Contractor               | Contract Number | Date     |
| General Contractor, Inc. | 99999           | 09/14/16 |

| Time of Inspection | Signature          | Weather              | Comments and/or Corrective Action                  |
|--------------------|--------------------|----------------------|--|
| Midnight           |                    |                      |  |
| 1 A.M.             |                    |                      |  |
| 2 A.M.             | <i>Mike Jones</i>  | Light Rain, 50F      | All Traffic Control good                           |
| 3 A.M.             |                    |                      |  |
| 4 A.M.             |                    |                      |  |
| 5 A.M.             |                    |                      |  |
| 6 A.M.             | <i>Mike Jones</i>  | Light Fog, Calm, 50F | All Traffic Control good                           |
| 7 A.M.             |                    |                      |  |
| 8 A.M.             |                    |                      |  |
| 9 A.M.             |                    |                      |  |
| 10 A.M.            |                    |                      | CONTRACTOR WORKED 8:00 am – 4:30 PM                |
| 11 A.M.            |                    |                      | PAY: 15.5/24 = 0.65 CAL DAY                        |
| Noon               |                    |                      | CALC'D BY: REJ 9-15-16 CK'D BY: <i>JAM</i> 9-15-16 |
| 1 P.M.             |                    |                      |  |
| 2 P.M.             |                    |                      |  |
| 3 P.M.             |                    |                      |  |
| 4 P.M.             |                    |                      |  |
| 5 P.M.             |                    |                      |  |
| 6 P.M.             | <i>Jack Hammer</i> | Partly cloudy, 62F   | Traffic control ok                                 |
| 7 P.M.             |                    |                      |  |
| 8 P.M.             |                    |                      |  |
| 9 P.M.             |                    |                      |  |
| 10 P.M.            | <i>Jack Hammer</i> | Clear and calm, 46F  | Moved barricade back in place, Traffic control ok  |
| 11 P.M.            |                    |                      |  |

E - 44

 Distribution: Contractor  
Resident

Completed forms must be turned in to the Resident the next working day.



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date September 6, 2016

Contractor or Sub. Artful Const.

Weather Partly Cloudy, 76°

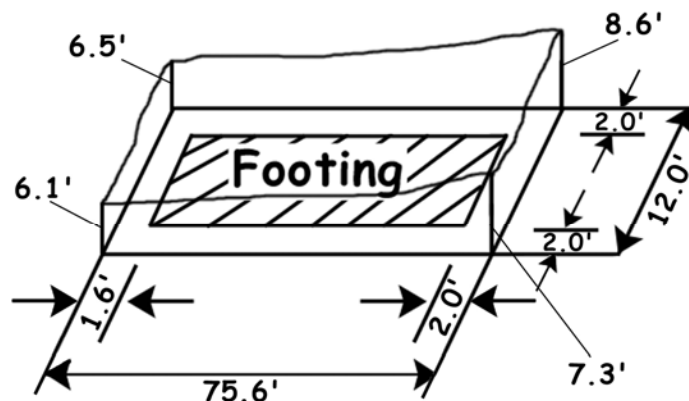
|                                  |                |
|----------------------------------|----------------|
| Initial(s)                       | Date           |
| Inspected by: <u>WNP</u>         | <u>9/6/16</u>  |
| Measured by: <u>WNP &amp; CJ</u> | <u>9/6/16</u>  |
| Calculated by: <u>WNP</u>        | <u>9/6/16</u>  |
| Checked by: <u>JS</u>            | <u>9/12/16</u> |

| Item Code # | Fund Code (Opt.) | Item             | Location        | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|------------------|-----------------|--------------------|--|------------------|
| 50200100    |                  | Structure Excav. | Pier #2 @       | 239.4 CY           |  | ✓                |
|             |                  |                  | Sta. 47 + 23.61 |                    |  |                  |
|             |                  |                  |                 |                    |  |                  |
|             |                  |                  |                 |                    |  |                  |
|             |                  |                  |                 |                    |  |                  |
|             |                  |                  |                 |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 50200100 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.



$$Vol = \left( \frac{8.6' + 7.3' + 6.1' + 6.5'}{4} \right) \times 75.6' \times 12.0' \times 1/27 = 239.4 \text{ CY}$$

NOTE:

Max allowable pay width = 2.0 ft + ftg. Width + 2.0 ft.

Max allowable pay length = 2.0 ft. + ftg. Length + 2.0 ft.

See FB #3, p. 23 for layout



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

Date 8-15-16

Contractor or Sub. Stan's Sewer Co.

Weather Clear, 70's

|                |                     |                |
|----------------|---------------------|----------------|
|                | Initial(s)          | Date           |
| Inspected by:  | <u>RCW</u>          | <u>8-15-16</u> |
| Measured by:   | <u>RCW &amp; MZ</u> | <u>8-15-16</u> |
| Calculated by: | <u>RCW</u>          | <u>8-15-16</u> |
| Checked by:    | <u>mf</u>           | <u>8-23-16</u> |

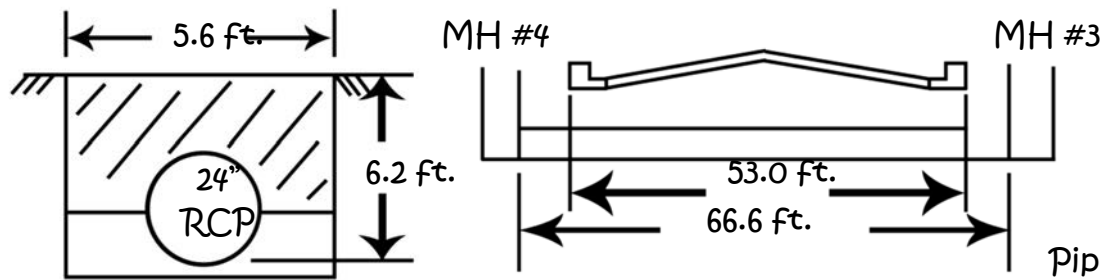
**JOB  
STAMP**

| Item Code # | Fund Code (Opt.) | Item             | Location      | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|------------------|---------------|--------------------|--|------------------|
| 20800150    |                  | Trench Backfill  | MH #3 to MH#4 | 55.2 CY            | Approved Srce. & Shipment Ticket           |                  |
|             |                  |                  |               |                    | (Mid-America S&G)                          |                  |
| 55022000    |                  | SS 2 RCP CL 3 24 | MH# 3 to MH#4 | 66.6 FT            | List and Mark (CMCM)                       |                  |
|             |                  |                  |               |                    |  |                  |
|             |                  |                  |               |                    |  |                  |
|             |                  |                  |               |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 20800150, 55022000 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.



Trench Backfill:

Pay Length = 2' + 53' + 2' = 57.0'

Trench Width > Max Pay Width

Therefore Use Table

$$0.968 \frac{\text{CY}}{\text{FT}} \times 57.0' = 55.2 \text{ CY}$$

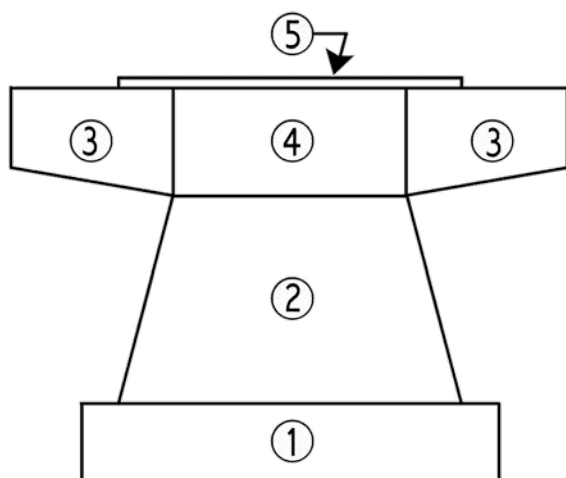
Pipe Markings: C-76-III

7-12-16 CMCM

CALC BY: jws 11-8-16  
CHECK BY: MLC 11/8/16

50300225

CONCRETE STRUCTURES



1.  $8.5' \times 2.25' \times 18.33' \times 1/27$  (no deduction for steel H-pile) = 12.98

2.  $\frac{12.0 + 16.0}{2} \times 16.25' \times 2.5' \times \frac{1}{27}$  = 21.06

3.  $2\left(\frac{2.5 + 5.5}{2}\right) \times 8.00' \times 2.5' \times \frac{1}{27}$  = 5.93

4.  $12.00' \times 5.50' \times 2.50' \times 1/27$  = 6.11

5.  $16.00' \times 0.11' \times 2.17' \times 1/27$  = 0.14

Total Conc. Pier 2      46.2  
cu yd

50800105

REINFORCEMENT BARS

| Bar                                  | Size | No. | Length<br>Ea. | #5      | #6    | #9     | #11    |
|--------------------------------------|------|-----|---------------|---------|-------|--------|--------|
| h9                                   | 5    | 4   | 27' - 9"      | 111.0   |       |        |        |
| h10                                  | 5    | 4   | 23' - 0"      | 92.0    |       |        |        |
| h11                                  | 5    | 36  | 11' - 9"      | 423.0   |       |        |        |
| n                                    | 5    | 36  | 4' - 10"      | 174.0   |       |        |        |
| p1                                   | 11   | 10  | 27' - 9"      |         |       |        | 277.5' |
| p2                                   | 5    | 8   | 9' - 3"       | 74.0    |       |        |        |
| s1                                   | 5    | 56  | 6' - 8"       | 373.3   |       |        |        |
| s2                                   | 5    | 36  | 8' - 8"       | 312.0   |       |        |        |
| s3                                   | 5    | 18  | 9' - 8"       | 174.0   |       |        |        |
| t1                                   | 9    | 22  | 8' - 3"       |         |       | 181.5' |        |
| u1                                   | 6    | 6   | 10' - 3"      |         | 61.5' |        |        |
| v7                                   | 5    | 36  | 20' - 6"      | 738.0   |       |        |        |
| w1                                   | 5    | 8   | 18' - 0"      | 144.0   |       |        |        |
| Total Length Each Size               |      |     |               | 2615.3' | 61.5' | 181.5' | 277.5' |
| x lbs./ft.                           |      |     |               | 1.043   | 1.502 | 3.400  | 5.313  |
| Total lbs. each size                 |      |     |               | 2727.8  | 92.4  | 617.1  | 1474.4 |
| Total lbs. rebar pier #2 = 4912 lbs. |      |     |               |         |       |        |        |

# SUMMARY OF FIELD COMPUTATIONS

50300225 CONC STRUCT  
 50300255 CONC SUP-STR  
 50800105 REINFORCEMENT BARS  
 50800205 REINF BARS, EPOXY CTD.

County  
 Section  
 Route  
 District  
 Contract No.  
 Job No.  
 Project No.

**JOB STAMP**

| LOCATION                 | CALCULATED<br>BY | CHECKED<br>BY  | PLAN QTY. | CALC. QTY. | PAY<br>QTY. |
|--------------------------|------------------|----------------|-----------|------------|-------------|
| CONCRETE SUPERSTRUCTURES |                  |                |           |            |             |
| DECK                     | JCS<br>8-23-16   | BDL<br>9-1-16  | 257.4 CY  | 259.8 CY   | 259.8 CY    |
| PARAPETS                 | JCS<br>8-23-16   | PLAN<br>CHECKS | 23.0      | 23.2       | 23.2        |
| TOTAL                    |                  |                | 280.4 CY  |            | 283.0 CY    |

ADD 2.6 CY AUTH #2

2.6

## CONCRETE STRUCTURES

|             |                |                |          |         |          |
|-------------|----------------|----------------|----------|---------|----------|
| 2 ABUTMENTS | BDL<br>8-23-16 | PLAN CHECKS    | 77.8 CY  | 77.5 CY | 77.5 CY  |
| PIERS 1 & 3 | BDL<br>8-23-16 | PLAN CHECKS    | 136.4    | 136.4   | 136.4    |
| PIER 2      | BDL<br>8-24-16 | JCS<br>8-24-16 | 79.0     | 74.0    | 74.0     |
| TOTAL       |                |                | 293.2 CY |         | 287.9 CY |

DEDUCT 5.3 CY AUTH. #2

## REINFORCEMENT BARS, EPOXY COATED

|          |                |                |           |        |           |
|----------|----------------|----------------|-----------|--------|-----------|
| DECK     | BDL<br>8-24-16 | jcs<br>8-24-16 | 52,910 LB | 52,804 | 52,804 LB |
| PARAPETS | jcs<br>8-23-16 | PLAN CHECKS    | 1,840     | 1,844  | 1,844     |
| TOTAL    |                |                | 54,750 LB |        | 54,648 LB |

DEDUCT 102 LBS AUTH. #2

## REINFORCEMENT BARS

|             |                |                |           |          |           |
|-------------|----------------|----------------|-----------|----------|-----------|
| 2 ABUTMENTS | JCS<br>8-30-16 | PLAN CHECKS    | 5,760 LB  | 5,756 LB | 5,756 LB  |
| PIERS 1 & 3 | BDL<br>9-1-16  | PLAN CHECKS    | 8,690     | 8,691    | 8,691     |
| PIER 2      | BDL<br>8-30-16 | PWR<br>8/30/16 | 6,030     | 5,912    | 5,912     |
| TOTAL       |                |                | 20,480 LB |          | 20,359 LB |

DEDUCT 121 LBS AUTH. #2





# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 10/13/17

Contractor or Sub. COLBERT CONCRETE

Weather PARTLY SUNNY, 62°

|                |                          |                         |
|----------------|--------------------------|-------------------------|
| Inspected by:  | Initial(s)<br><u>MRL</u> | Date<br><u>10/13/17</u> |
| Measured by:   | <u>MRL + MN</u>          | <u>10/13/17</u>         |
| Calculated by: | <u>MRL</u>               | <u>10/13/17</u>         |
| Checked by:    | <u>MN</u>                | <u>10/13/17</u>         |

| Item Code # | Fund Code (Opt.) | Item                | Location      | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|---------------------|---------------|--------------------|--|------------------|
| 60600095    |                  | CL SI CONC (OUTLET) | NB STA 705+42 | 3.53 C.Y. ✓        | DAILY PLANT REPORT & TICKET & TEST         | DQ #61           |
|             |                  |                     |               |                    |  |                  |
|             |                  |                     |               |                    |  |                  |
|             |                  |                     |               |                    |  |                  |
|             |                  |                     |               |                    |  |                  |
|             |                  |                     |               |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 60600095 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

BUILT ACCORDING TO STANDARD 606006-03, "OUTLETS FOR CONCRETE CURB AND GUTTER TY B-6.24"

OUTLET LENGTH (MEASURED FROM END OF RADIUS) = 16.6' ✓

SECTION A-A TO E-E

2.38 C.Y.(FROM STANDARD) ✓

SECTION F-F 16.6' X 0.069 C.Y·PER FT

+ 1.15 C.Y. ✓

TOTAL

3.53 C.Y. ✓

Printed 10/13/2017

BC 628 (Rev. 8/04)

SURFACE VARIATIONS

ITEM XXX21600 SURF VAR HMA SC 2T

| LANE    | WHEEL<br>PATH | STATION |
|---------|---------------|---------|
| EB      | L             | 787+43  |
|         |               | 788+16  |
|         |               | +22     |
|         |               | +25     |
|         |               | 793+37  |
|         |               | 798+75  |
|         |               | 814+43  |
| EB      | R             | 788+16  |
|         |               | +22     |
|         |               | 790+48  |
|         |               | 793+37  |
|         |               | 798+72  |
|         |               | +75     |
|         |               | 814+43  |
| TOTAL = |               | 14 EACH |

Measured By: MD 6/24/16

Calculated By: MD 6/24/16

Checked By: VC 6/24/16

6/24/16

PG. 39

CLEAR, 83°

**NOTE:** Per Article 406.11 of the Standard Specifications, the cost of one or two tons of surface mix shall be deducted from the contract for each surface variation measured in the wheel paths. This information would be shown in the explanation on the authorization:

|                          |   |                            |
|--------------------------|---|----------------------------|
| Cost of 1 ton of Surface | = | \$ 73.43                   |
| Cost of 2 tons           | = | \$146.86                   |
| 14 variations @ \$146.86 | = | \$2,056.04 total deduction |

On the authorization show a negative unit price (-146.86), and a positive quantity (14 Each) which will result in a "negative addition" to the authorization.



**Quantity Sheet**

County 117

Section 59-1, 2(I-2); 68-1, 2(I-2)

Route FAI 55

District 06

Contract No. 72B21

Job No. C-96-023-12

Project

Page 16

Item 70100800

TRAF CONT PROT 701401

Fund 07E0A01

Plan Quantity 1.000

Unit Measure L SUM

Contract Unit Price 28000.00

**Authorizations**

| Number | Date App'vd | Add | Deduct | Total |
|--------|-------------|-----|--------|-------|
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |

Cnty Const Sfty

117 I000 2A

Quantity

1.000

| Date     | Station to Station<br>Location or Description | Quantities Placed |         |         | Evidence of<br>Material Inspection  | Progress<br>Document Source |
|----------|---|-------------------|---------|---------|---|-----------------------------|
|          |   | This Date         | To Date | Pay Est |   |                             |
|          | From Progress Schedule Total                  |                   |         |         | N/A   | -----                       |
|          | Est. Months of Use = 9                        |                   |         |         |   |                             |
|          |   |                   |         |         |   |                             |
| 3/22/16  | Initial Setup                                 | 0.25              | 0.25    |         |   |                             |
| 4/1/16   | 0.5 MO/9 MO. X 65%                            | 0.04              | 0.29    | #1      |   |                             |
| 4/22/16  | 1 MO/9MO X 65%                                | 0.07              | 0.36    | #2      |   |                             |
| 5/27/16  | “   | 0.07              | 0.43    | #3      |   |                             |
| 6/24/16  | “   | 0.07              | 0.50    | #4      |   |                             |
| 7/22/16  | “   | 0.07              | 0.57    | #5      |   |                             |
| 8/26/16  | “   | 0.07              | 0.64    | #6      |   |                             |
| 9/23/16  | “   | 0.07              | 0.71    | #7      | *Note: The Total Value Of<br>Work Items Covered By This<br>Traffic Control Item Increased<br>By 10%. See Calc. On Opposite<br>Page. |                             |
| 10/21/16 | “   | 0.07              | 0.78    | #8      |   |                             |
| 11/18/16 | TRAF CONT.<br>REMOVED                         | 0.22              | 1.0     | #9      |   |                             |
|          |   |                   | FINAL   |         |   |                             |
|          |   |                   |         |         |   |                             |
|          |   |                   |         |         |   |                             |

Source of documentation  
for final quantity: -----

XXX03100 T.C. PRICE ADJUSTMENT  
FOR STD. 701401

| DESCRIPTION  | UNIT       | UNIT PRICE |
|--|------------|------------|
| CLA PATCH T2 12  | SQ. YD.    | \$185.00   |
| CLA PATCH T3 12  | SQ. YD.    | \$160.00   |
| CLA PATCH T4 12  | SQ. YD.    | \$155.00   |
| CLA PATCH T2 14  | SQ. YD.    | \$200.00   |
| CLA PATCH T3 14  | SQ. YD.    | \$190.00   |
| PATCH REINF.   | SQ. YD.    | \$60.00    |
| SAW CUTS   | FT.        | \$1.00     |
| SUBGRADE REPAIR  | DOLLAR     | \$1.00     |
| CLA PATCH T2 13  | SQ. YD.    | \$190.00   |
| TIE BARS   | EACH       | \$15.00    |
| <br>(FINAL COST - PLAN COST) = (118,000.45 - 106,529.00) |            |            |
| PLAN COST  | 106,529.00 |            |
|  | = 10.768%  | > 10%      |
| <br>$P = 28,000$ (BID UNIT PRICE FOR STD. 701401)        |            |            |
| $X = \frac{(118,000.45 - 106,529.00)}{106,529}$          |            |            |
| $ADJ. UNIT PRICE = 0.25P + 0.75P[1 + (X - 0.1)]$         |            |            |
| $= 28,161.36$  |            |            |
| $ADJUSTMENT = \$28,161.36 - \$28,000 = \$161.36$         |            |            |

PG. 4

| PLAN QTY                      | PLAN COST           | FINAL QTY | FINAL COST          |
|-------------------------------|---------------------|-----------|---------------------|
| 155                           | \$28,675.00         | 169.6     | \$31,376.00         |
| 48                            | \$7,680.00          | 59.5      | \$9,520.00          |
| 31                            | \$4,805.00          | 30.2      | \$4,681.00          |
| 159                           | \$31,800.00         | 193.1     | \$38,620.00         |
| 16                            | \$3,040.00          | 0.0       | \$0.00              |
| 420                           | \$25,200.00         | 459.1     | \$27,546.00         |
| 3059                          | \$3,059.00          | 3241.4    | \$3,241.40          |
| 0                             | \$0.00              | 852.05    | \$852.05            |
| 11                            | \$2,090.00          | 10.6      | \$2,014.00          |
| 12                            | \$180.00            | 10.0      | \$150.00            |
| TOTAL                         | <u>\$106,529.00</u> |           | <u>\$118,000.45</u> |
| THEREFORE - ADJUSTMENT NEEDED |                     |           |                     |
| Measured By:                  |                     |           |                     |
| Calculated By: MD 6/24/16     |                     |           |                     |
| Checked By: VMC 6/24/16       |                     |           |                     |
| <br>$PAY XXX03100 = \$161.36$ |                     |           |                     |



## County 117

Section 59-1, 2(I-2); 68-1, 2(I-2)

Route FAI 55

District 06

Contract No. 72B21

Job No. C-96-023-12

Project

Page 27

Item XXX03100

Traf Cont Price Adj

Fund 07E0A01

Plan Quantity 0

Unit Measure L SUM

Contract Unit Price 161.36

Cnty Const Sfty

117 I000 2A

Quantity

0.000

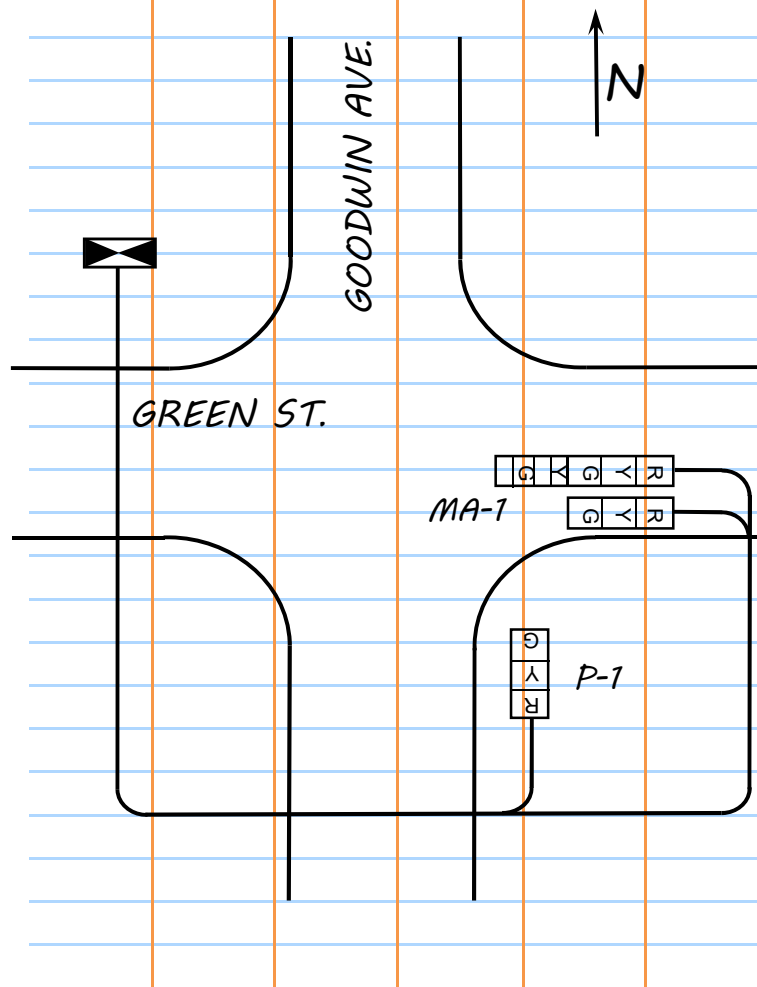
| Number | Date App'vd | Add | Deduct | Total |
|--------|-------------|-----|--------|-------|
| 16     | 12/19/16    | 1.0 |        | 1.0   |
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |
|        |             |     |        |       |

[illegible]

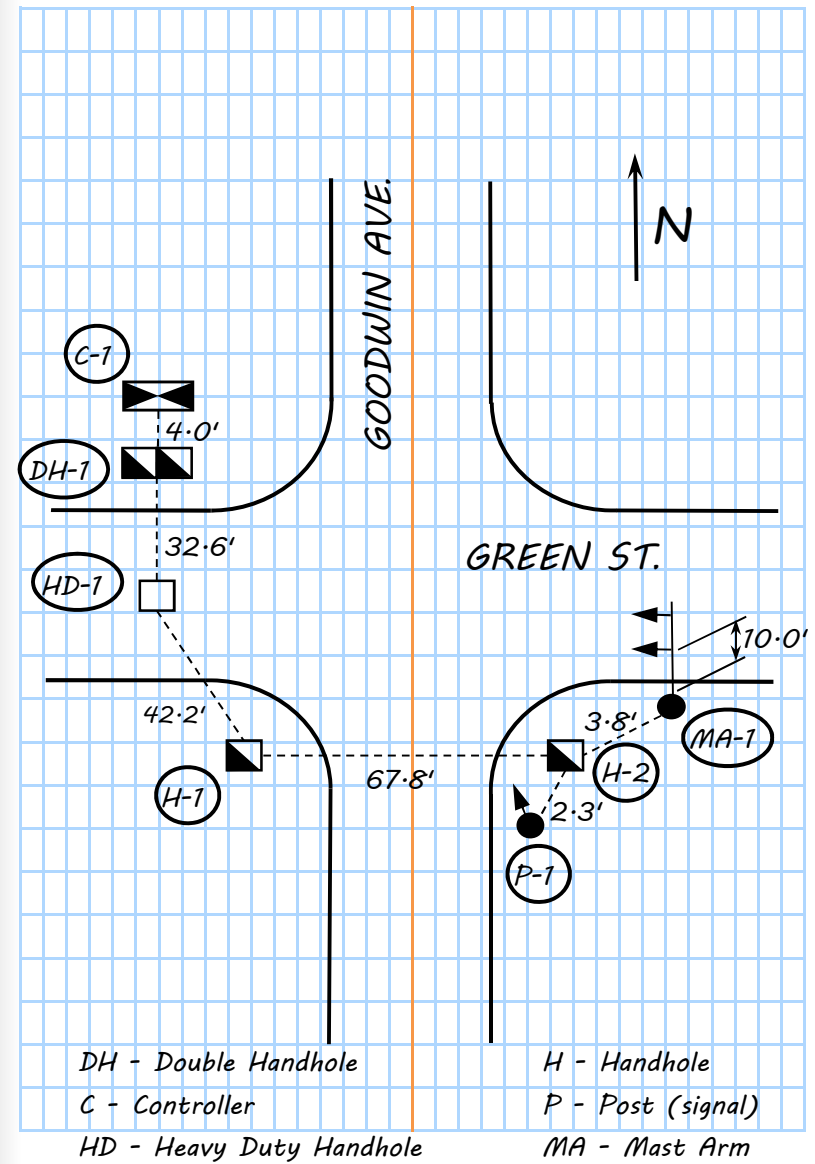
Source of documentation

for final quantity: See spreadsheet in Calc file

87301245 ELCBL C SIGNAL 14 5C



PG. 43



87301245 ELCBL C SIGNAL 14 5C

| DATE               | FROM     | TO          | LENGTH | SLACK | VERTICAL |
|--------------------|----------|-------------|--------|-------|----------|
| 6/21               | C-1      | DH-1        | 4.0'   | 13.0' | 3.0'     |
|                    | DH-1     | HD-1        | 32.6'  | 6.5'  |          |
|                    | HD-1     | H-1         | 42.2'  | 6.5'  |          |
|                    | H-1      | H-2         | 67.8'  | 6.5'  |          |
| "A-1"              | SUBTOTAL |             | 146.6' | 32.5' | 3.0'     |
|                    | H-2      | P-1         | 2.3'   |       | 3.0'     |
|                    | P-1      | SIGNAL HEAD |        |       | 13.0'    |
| "A-1"              | C-1      | H-2         | 146.6' | 32.5' | 3.0'     |
|                    | H-2      | MA-1        | 3.8'   |       | 3.0'     |
|                    | MA-1     | SIGNAL HEAD | 10.0'  |       | 20.0'    |
| Final Measurement: |          |             | 419.3' |       |          |

PG. 44

| RUN TOTAL                     | TOTAL  | NOTES                                      |
|-------------------------------|--------|--|
|                               |        | SEE PAGE 43 FOR SCHEMATIC AND MEASUREMENTS |
| 200.4'                        |        |  |
| 218.9'                        | 419.3' |  |
| Measured By: EAL & CR 6/24/16 |        |  |
| Calculated By: EAL 6/24/16    |        |  |
| Checked By: CR 6/24/16        |        |  |



## PIPE CULVERT

| ITEM                               | DESCRIPTION    | STA.               | DATE<br>INST. |
|------------------------------------|----------------|--------------------|---------------|
| 542A0235                           | P CUL CL A 130 | 10+50              | 7/11/16       |
| "                                  | "              | 11+90              | "             |
| "                                  | "              | 13+24              | 7/12/16       |
| 542A0241                           | P CUL CL A 136 | 14+18              | "             |
| 542A0247                           | P CUL CL A 142 | 15+95              | 7/13/16       |
| 542A0235                           | P CUL CL A 130 | 18+02              | "             |
| SUBCONTRACTOR: ROGERS CONSTRUCTION |                |                    |               |
| WEATHER:                           |                |                    |               |
|                                    | 7/11/16        | SUNNY, 79°         |               |
|                                    | 7/12/16        | SUNNY, 82°         |               |
|                                    | 7/13/16        | PARTLY CLOUDY, 75° |               |
| ALL FROM AMER. PIPE CO.            |                |                    |               |
| (APPROVED LIST & MARK)             |                |                    |               |

PG. 83

| STAKED<br>LENGTH                         | MEASURED<br>LENGTH | PAY<br>LENGTH |
|--|--------------------|---------------|
| 31.0'                                    | 31.2'              | 31.0' ✓       |
| 27.0'                                    | 28.3'              | 27.0' ✓       |
| 50.0'                                    | 49.3'              | 49.3' ✓       |
| 24.0'                                    | 24.0'              | 24.0' ✓       |
| 112.0' *                                 | 112.7'             | 112.0' ✓      |
| 21.0'                                    | 21.0'              | 21.0' ✓       |
| * PLAN LENGTH OF 100.0' IS IN ERROR.     |                    |               |
| TOTAL PAY LENGTHS:                       |                    |               |
|  | 542A0235           | 128.3' ✓      |
|  | 542A0241           | 24.0' ✓       |
|  | 542A0247           | 112.0' ✓      |
| STAKED LENGTH CHECKED BY: MD & VC 7/6/16 |                    |               |
| Measured By:                             | MD & VC            | 7/13/16       |
| Calculated By:                           | MD                 | 7/13/16       |
| Checked By:                              | VMC                | 7/13/16       |



February 24, 2016

County  
Section  
Route  
Contract No.

Don Doe, Superintendent  
ACME Construction  
1200 North Easy Street  
Anyplace, IL

Dear Mr. Doe:

As specified in Article 512.16 of the Standard Specifications for Road and Bridge Construction, you are hereby being provided this itemized list of authorized lengths of metal pile shells to furnish for the structure for the above route and section.

It has been determined from the test piles driven on February 18, 2016 that the following lengths should be furnished:

|        |               |   |              |
|--------|---------------|---|--------------|
| E Abut | 23 pile @ 24' | = | 552 lin. ft. |
| Pier 1 | 32 pile @ 30' | = | 960 lin. ft. |
| W Abut | 23 pile @ 36' | = | 828 lin. ft. |

Very Truly Yours,

*John Smith*

John Smith  
District Engineer

Note:  
Final documentation for  
FURNISHING PILES consists of a  
copy of the itemized list which was  
given to the Contractor and field  
measurements of the delivered  
piling.

DATE: TUESDAY 6/28/16

WEATHER: MOSTLY SUNNY, 60° AM

PARTLY CLOUDY, 76° PM

CONTRACTOR: NEWMARK (7 AM - 3:30 PM)

PAY ITEMS:

51200956 FURN METAL PILE SHELLS, 12" x 0.179"

51202305 DRIVING PILES

CREW: 1 FOREMAN, 4 CARPENTERS,

2 OPERATORS

EQUIPMENT: 1 CRANE (LINK BELT LS 138H II)

1 HAMMER APE D19-42

4190 LB RAM

$E_{MAX} = 47 \text{ K} \cdot \text{FT} @ H = 11.25'$

$E_{MIN} = 23 \text{ K} \cdot \text{FT} @ H = 5.5'$

SINGLE ACTING HAMMER

NOMINAL REQ'D BEARING: 256 KIPS

NUMBER REQ'D: 7, INCLUDING TEST PILE

FURNISHED LENGTH: 50' (SEE LETTER 6/13/16)

NOMINAL DRIVEN BEARING:

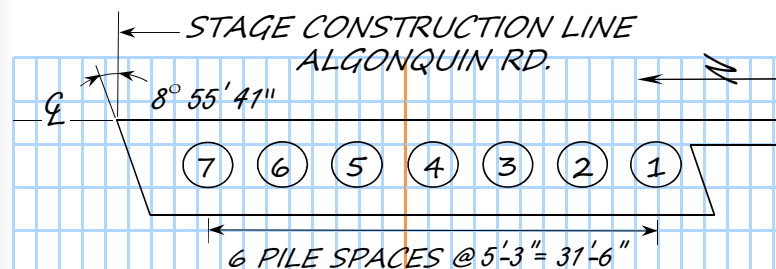
$$R_{NDB} = \frac{6.6 F_{eff} E \ln(10 N_b)}{1000}$$

1000

Measured By: EA & ML 6/28/16

Calculated By: EA 6/28/16

Checked By: MSL 6/28/16



| HEAT NO. | PILE NO. | FURN. LEN. | DEL. LEN. | CUT OFF | DRIVEN LEN. | BLOW /IN. | FINAL E K · FT |
|----------|----------|------------|-----------|---------|-------------|-----------|----------------|
| 615203   | 1        | 50.0'      | 50.02'    | 1.92'   | 48.10'      | ✓ 3.6     | 23.0           |
| 615203   | 2        | 50.0'      | 51.12'    | 8.08'   | 43.04'      | ✓ 2.7     | 25.1           |
| 615203   | 3        | 50.0'      | 50.00'    | 4.92'   | 45.08'      | ✓ 1.7     | 29.3           |
| 615203   | 4        | 50.0'      | 50.03'    | 6.00'   | 44.03'      | ✓ 2.1     | 27.2           |
| 615203   | 5        | 50.0'      | 50.08'    | 5.33'   | 44.75'      | ✓ 2.7     | 25.1           |
| 168847   | 6        | 50.0'      | 50.04'    | 3.42'   | 46.62'      | ✓ 2.1     | 27.1           |
|          | 7        | TEST PILE  |           |         |             |           |                |

300.0' ✓

271.62" ✓

PAY: 51200956 → 300.00' ✓

51202305 → 271.62' ✓

| PILE BEARING ACCEPTANCE TABLE |        |      |      |      |      |      |      |          |
|-------------------------------|--------|------|------|------|------|------|------|----------|
| H                             | 5.5    | 6.0  | 6.5  | 7.0  | 7.5  | 8.0  | 8.5  | FT.      |
| E                             | 23.0** | 25.1 | 27.2 | 29.3 | 31.4 | 33.5 | 35.6 | K · FT   |
| $N_b$                         | 3.6    | 2.7  | 2.1  | 1.7  | 1.4  | 1.2  | 1.0* | BLOWS/IN |

\* Controlled by IDOT Spec.

\*\* Controlled by hammer limits.

PQ. 23



# Illinois Department of Transportation

## Test Pile Driving Record

Structure Number 016-2861 Date Driving Started 6/21/2016 Date Completed 6/22/2016 Sheet 1 of 1  
 Abutment/Pier No. East Abut. (Stage 1) Calculated by RMW Route FAP 343  
 Pile Type & Size Metal Shell 12" dia w/.179" walls Checked by WMK Section 70D-Y-B-R & 70HB-R-1  
 Nominal Required Bearing 372 kips Estimated Plan Length 69 ft. County COOK  
 Pile Cutoff Elevation 873.77 ft. Authorized Furnished Length 78 ft. Contract 62897  
 Ground Surface Elev. At Pile While Driving 840.23 ft.\* Closest Boring(s) B-1 & sb-5 Driven Bearing Verification Gates  
 Hammer Make & Model Delmag D30-32 Hammer Cushion Material & Thickness Conbest, 2" thick  
 Max. Operating Energy 55,898 ft.-lbs. Min. Operating Energy 25,383 ft.-lbs. Pile Helmet Weight 4250 lbs.

| Tip Elevation (Feet) | Distance Below Cut Off | Blows Per (Inch) | Hammer Energy Developed | Nominal Driven Bearing | Tip Elevation (Feet) | Distance Below Cut Off | Blows Per (Inch) | Hammer Energy Developed | Nominal Driven Bearing |
|----------------------|------------------------|------------------|-------------------------|------------------------|----------------------|------------------------|------------------|-------------------------|------------------------|
| 840.23               | 31.54                  |                  |                         |                        | 811.23               | 61.54                  | 1.1              | 36400                   | 248                    |
| 839.23               | 32.54                  |                  |                         |                        | 810.23               | 62.54                  | 1.1              | 34125                   | 237                    |
| 838.23               | 33.54                  |                  |                         |                        | 809.23               | 63.54                  | 1.0              | 31850                   | 212                    |
| 837.23               | 34.54                  |                  |                         |                        | 808.23               | 64.54                  | 0.9              | 36400                   | 219                    |
| 836.23               | 35.54                  |                  |                         |                        | 807.23               | 65.54                  | 1.1              | 36400                   | 248                    |
| 835.23               | 36.54                  |                  |                         |                        | 806.23               | 66.54                  | 1.2              | 40650                   | 282                    |
| 834.23               | 37.54                  | <0.5             | <25383                  |                        | 805.23               | 67.54                  | 1.1              | 38675                   | 258                    |
| 833.23               | 38.54                  | <0.5             | <25383                  |                        | 804.23               | 68.54                  | 1.3              | 40950                   | 294                    |
| 832.23               | 39.54                  | <0.5             | <25383                  |                        | 803.23               | 69.54                  | 1.3              | 40950                   | 294                    |
| 831.23               | 40.54                  | <0.5             | <25383                  |                        | 802.23               | 70.54                  | 1.3              | 47775                   | 326                    |
| 830.23               | 41.54                  | <0.5             | <25383                  |                        | 801.23               | 71.54                  | 1.5              | 45500                   | 339                    |
| 829.23               | 42.54                  | <0.5             | <25383                  |                        | 800.23               | 72.54                  | 2.5              | 45500                   | 422                    |
| 828.23               | 43.54                  | <0.5             | <25383                  |                        | 799.23               | 73.54                  | 2.2              | 47775                   | 413                    |
| 827.23               | 44.54                  | <0.5             | <25383                  |                        | 798.23               | 75.54                  | 2.5              | 43225                   | 409                    |
| 826.23               | 45.54                  | 0.5              | 27300                   | 102                    | 797.23               | 76.54                  | 2.5              | 43225                   | 409                    |
| 825.23               | 46.54                  | 0.5              | 27300                   | 102                    | 796.23               | 77.54                  | 2.5              | 45500                   | 422                    |
| 824.23               | 47.54                  | 0.5              | 31850                   | 118                    |                      |                        |                  |                         |                        |
| 823.23               | 48.54                  | 0.7              | 27300                   | 144                    |                      |                        |                  |                         |                        |
| 822.23               | 49.54                  | 0.7              | 27300                   | 144                    |                      |                        |                  |                         |                        |
| 821.23               | 50.54                  | 0.7              | 27300                   | 144                    |                      |                        |                  |                         |                        |
| 820.23               | 51.54                  | 0.6              | 27300                   | 125                    |                      |                        |                  |                         |                        |
| 819.23               | 52.54                  | 0.6              | 31850                   | 143                    |                      |                        |                  |                         |                        |
| 818.23               | 53.54                  | 0.8              | 29575                   | 172                    |                      |                        |                  |                         |                        |
| 817.23               | 55.54                  | 1                | 29575                   | 201                    |                      |                        |                  |                         |                        |
| 816.23               | 56.54                  | 1                | 27300                   | 189                    |                      |                        |                  |                         |                        |
| 815.23               | 57.54                  | 0.5              | 31850                   | 118                    |                      |                        |                  |                         |                        |
| 814.23               | 58.54                  | 0.5              | 31850                   | 118                    |                      |                        |                  |                         |                        |
| 813.23               | 59.54                  | 0.5              | 34125                   | 126                    |                      |                        |                  |                         |                        |
| 812.23               | 60.54                  | 0.8              | 34125                   | 192                    |                      |                        |                  |                         |                        |

Driving Observations and Comments: Hammer would not fire until 835.23, Could not Read Energy until elevation 825.23

\*reflects being driven from bottom of plan specified precored hole elevation

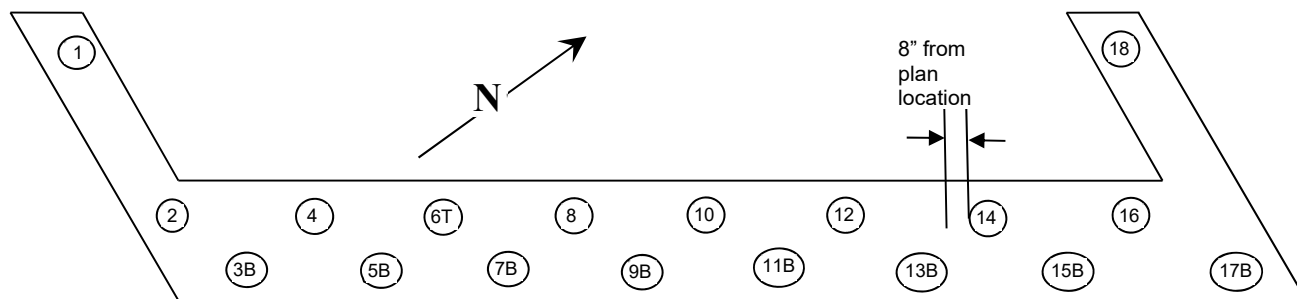
min. test pile driven bearing = 372kips X 1.10 = 409 kips

First consistant Bearing around 73 ft ---- order ~ 78ft. since boring st-5 shows stiffer soil at deeper elevation.



Structure Number 016-2861 Date Driving Started 10/19/2016 Date Completed 10/22/2016 Sheet 1 of 1  
 Abutment/Pier No. East Abut. (Stage 1) Calculated by RMW Route FAP 343  
 Pile Type & Size Metal Shell 12" dia w/.179" walls Checked by WMK Section 70D-Y-B-R & 70HB-R-1  
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 Pile Cutoff Elevation 873.77 ft. Authorized Furnished Length 78 ft. Contract 62897  
 Ground Surface Elev. At Pile While Driving 840.23 ft.\* Closest Boring(s) B-1 & sb-5 Driven Bearing Verification Gates  
 Hammer Make & Model Delmag D30-32 Hammer Cushion Material & Thickness Conbest, 2" thick  
 Max. Operating Energy 55,898 ft.-lbs. Min. Operating Energy 25,383 ft.-lbs. Pile Helmet Weight 4250 lbs.

As driven pile layout sketch with piles numbered, north arrow included, and any significant deviations from plan locations noted



Indicate (B) at battered piles and (T) at test piles

| Pile No. | Delivered Length (Feet) | Added Splice Length | Final Cutoff Length | Paid Driven Length | Paid Furnished Length | Blows Per (Inch) | Hammer Energy Developed | Nominal Driven Bearing | Driving Observations & Comments                 |
|----------|-------------------------|---------------------|---------------------|--------------------|-----------------------|------------------|-------------------------|------------------------|---|
| 1        | 81.8                    | 0                   | 3                   | 78.8               | 78.8                  | 2                | 43225                   | 373                    | 82 ft piles delivered as two 41 ft. sections    |
| 2        | 81.8                    | 0                   | 10.5                | 71.3               | 78                    | 2.5              | 38675                   | 381                    |   |
| 3B       | 82                      | 0                   | 5                   | 77                 | 78                    | 3                | 34125                   | 378                    |   |
| 4        | 82                      | 0                   | 4                   | 78                 | 78                    | 2                | 43225                   | 373                    | Bend in Pile 4 occurred 10' prior to bearing,   |
| 5B       | 82                      | 0                   | 5                   | 80                 | 80                    | 2.4              | 38675                   | 375                    | cut out bend and re-splied pile per BBS         |
| 6T       | -----                   | -----               | -----               | -----              | -----                 | 2.5              | 45500                   | 422                    | Test pile driven on 6/22/07                     |
| 7B       | 82.1                    | 0                   | 6                   | 76.1               | 78                    | 3.1              | 36400                   | 398                    |   |
| 8        | 82.1                    | 0                   | 6                   | 76.1               | 78                    | 3.5              | 36400                   | 416                    |   |
| 9B       | 82.2                    | 0                   | 5                   | 77.2               | 78                    | 4                | 36400                   | 435                    |   |
| 10       | 78                      | 0                   | 1                   | 76.6               | 78                    | 2.5              | 38675                   | 381                    | 78 ft. long piles were composed of 20+38+20     |
| 11B      | 78.1                    | 0                   | 1.5                 | 76.1               | 78                    | 2                | 43225                   | 373                    |   |
| 12       | 78.1                    | 0                   | 2                   | 76.1               | 78                    | 2.4              | 38675                   | 375                    |   |
| 13B      | 78.1                    | 10.5**              | 6                   | 82.6               | 78                    | 3                | 34125                   | 378                    |   |
| 14       | 78.2                    | 5**                 | 1.5                 | 81.7               | 78                    | 2.5              | 38675                   | 381                    | Pile hit something at 12' below precore and     |
| 15B      | 78                      | 10                  | 5.8                 | 82.2               | 88                    | 3.5              | 34125                   | 399                    | moved out of 6" tolerance (ok per BBS)          |
| 16       | 78.1                    | 10                  | 5.8                 | 82.2               | 88                    | 3                | 36400                   | 393                    |   |
| 17B      | 78.1                    | 10                  | 5.9                 | 82.1               | 88                    | 3.1              | 34125                   | 382                    |   |
| 18       | 78.1                    | 10                  | 5.2                 | 82.9               | 88                    | 3.4              | 31850                   | 378                    |   |
|          |                         |                     |                     |                    |                       |                  |                         |                        |   |
|          |                         |                     |                     |                    |                       |                  |                         |                        |   |
|          |                         |                     |                     |                    |                       |                  |                         |                        |   |
|          |                         |                     |                     |                    |                       |                  |                         |                        |   |
|          |                         |                     |                     |                    |                       |                  |                         |                        | *elevation reflects +/- 30ft. precore specified |
|          |                         |                     |                     |                    |                       |                  |                         |                        | **Not paid as furnished since obtained from Cut |
|          |                         |                     |                     |                    |                       |                  |                         |                        | off sections from piles 2 and 3B                |

cc: Bureau of Bridges and Structures

9-5-07  
40600100  
BIT MATLS (PRIME COAT)  
STA 1 + 20  
to 23 + 06

Contract 97311

Calc by: MAN 9-5-07  
Check by: JN 9-7-07

0. C  
13.00 -  
10.71 =  
2.29 \*  
tons  
0. C  
2.29 X  
2000 =  
4580.0 \*  
lbs.  
0. C  
4580.0 ÷  
8.328 ÷  
0.943 =  
583 \*  
gallons

Pay 583 Gallons

Evidence of  
Material List & Bill of  
Inspection : Lading

This is an example of the documentation requirement for bituminous materials prime coat items paid on a gallon basis.

This adding machine tape is to be securely bound around the truck ticket(s) for each pay item for each day.

## MACLAIR ASPHALT SALES, LLC

PLANT AND OFFICE  
6303 COLLINSVILLE ROAD  
COLLINSVILLE, ILLINOIS 62234  
PHONE: (618) 271-7470 FAX: (618) 271-0830

SOLD TO:  
KEELEY & SONS

TICKET NO. **E 3**  
Job: 713  
PARIS AVENUE  
CAHOKIA, IL.  
CONTRACT NO. 97311

| 713 | Acc't No. | Truck | Tons | Product | Product Description |
|-----|-----------|-------|------|---------|---------------------|
|     | 3600      | EJ16  | 2.29 | 913     | PRIME RC-70         |

Loads: 1 Accum. Amount: 2.29 TONS  
GROSS: 13.00 TN Manual Wt.  
TARE: 10.71 TN Manual Wt.  
NET: 2.29 TN

DAWN B.

583 gals.

FR

Received By:

WARNING - HOT BITUMINOUS MIX/HAZARDOUS MATERIAL-MSD SHEET AVAILABLE

### STRAIGHT BILL OF LADING

Shipper's No. **24645**

### DELIVERY TIME

CARRIER **E. J. Dougherty**

RECEIVED, subject to, the classifications and tariffs in effect on the date of the issue of this bill of lading.

at Hazelwood, Missouri 20 07 CONSIGNOR Spirit Asphalt Incorporated

The property described below, in apparent good order except as noted (contents and condition of contents of packages unknown) named, consigned, and delivered as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carload of all or any of said property over all or any portion of said route to destination, and as to each party as any hereinbefore in all or any said property that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Consensus Straight Bill of Lading set forth (1) in Uniform Freight Classification in effect on the date hereof; (2) in a bill of lading, shipment, or (3) in the applicable motor carrier classification or tariff in effect on the date hereof.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to **E. J. Dougherty Oil**  
1501 Lincoln Ave  
E. St. Louis, IL  
62204

**"FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT CALL CHEMTREC, 1/800-424-9300 DAY OR NIGHT."**

Destination Same

### WEIGHT LBS INITIAL WEIGHT

11:14 AM 06/08/07

TRUCK ID: 225-178

WEIGHT IN: 30400 lb GROSS

12:01 PM 06/08/07

TRUCK ID: 225-178

Gross Wt: 77680 lb

Tare Wt: 30400 lb

Net Wt: 47280 lb

TARE

NET

1 T/L

Delivering Carrier: **EJ Dougherty**

Customer P.O.:

Description

Product **RC-70**

Tank No. 45

Lab No. RR 7015

Gallons 6023

Seal No.

Project No.

RC-70

Job 713

Contract 97311

Per

FREIGHT CHARGES  
Subject to Section 7 of conditions of applicable bill of lading, if this shipment is to be delivered to the buyer without recourse on the seller, the seller shall sign the following statement:  
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Per  
(Signature of Seller)  
If charges are to be prepaid write or stamp here, "To Be Prepaid"

Received \$  
to apply in prepayment of the charges on the property described herein.

Agent or Cashier

Per  
(The signature here acknowledges only the amounts prepaid.)



**Illinois Department  
of Transportation**

**Weekly Trainee Report**

Contractor ACME CONSTRUCTION CO.

County: \_\_\_\_\_

Report No. 7 Week Ending 06-24-16

Section: \_\_\_\_\_

Route: \_\_\_\_\_

District: \_\_\_\_\_

Contract: \_\_\_\_\_

Job No.: \_\_\_\_\_

Project: \_\_\_\_\_

**JOB STAMP**

| (1)<br>Trainee Name and<br>Individual Identification Number | (2)<br>Ethnic<br>Group | (3)<br>FHWA                         | (4)<br>IDOT<br>MRB       | (5)<br>TPG               | (6)<br>Work<br>Classification | (7)<br>Status | (8)<br>Hours and Days Worked |   |   |   |    |   | (9)<br>Hours<br>this<br>Week | (10)<br>Hours<br>to<br>Date |     |
|---|------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------|---------------|------------------------------|---|---|---|----|---|------------------------------|-----------------------------|-----|
| JUANITA SANCHEZ, 6155                                       | H                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | CM                            | A             | 8                            | 8 | 0 | 0 | 10 | 8 | 4                            | 38                          | 253 |
| ERNEST JACKSON, 7521  | B                      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | CA                            | T             | 8                            | 8 | 0 | 0 | 8  | 8 | 4                            | 36                          | 247 |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |
|   |                        | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                               |               |                              |   |   |   |    |   |                              |                             |     |

NOTE:  
Final documentation for the pay item, TRAINEES,  
consists of this form completed weekly for all  
"Trainees" employed in accordance with the  
Training Special Provisions included in your  
contract.

I hereby certify that the hours of training listed above were given to those trainees working on the above designated project.

These hours were checked against the contractor's payroll in addition to visual job site inspection

John Smith  
Contractor's Representative

Rich M. Hixon  
State's Representative



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 9-26-16

Contractor or Sub. Wortman-Starwalt Inc.

Weather CLEAR 80°

Initial(s)

Date

Inspected by: ALG

9-26-16

Measured by: ALG

9-26-16

Calculated by: \_\_\_\_\_

Checked by: KPR

9-26-16

| Item Code # | Fund Code (Opt.) | Item              | Location                | Quantity and Units | Evidence of Material Inspection (Optional)      | Posted in Q Book |
|-------------|------------------|-------------------|-------------------------|--------------------|---|------------------|
| 50500405    |                  | F&E STRUCT. STEEL | N. Tri-Level MID Bridge | 3140 lbs           | Fabrication Inspector's Release (BBS 59) & Cert | ✓                |
|             |                  |                   |                         |                    |   |                  |
|             |                  |                   |                         |                    |   |                  |
|             |                  |                   |                         |                    |   |                  |
|             |                  |                   |                         |                    |   |                  |
|             |                  |                   |                         |                    |   |                  |

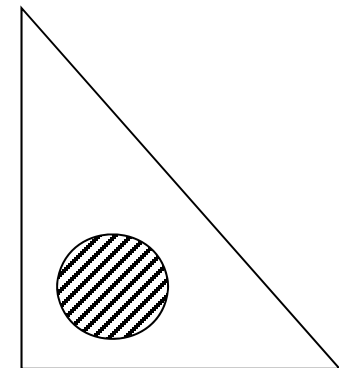
This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 50500405 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Angles weighed on approved scale at Effingham Equity.  
Scale No. IL 4201 (9-1-16). See wt. ticket in str. steel file.

Note: Bill of Lading from fabricator indicates  
wt of steel = 3200 lb  
actual wt = 3140 lb





# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 9-23-16

Contractor or Sub. INTERSTATE

Weather SUNNY, 70-75

|                |                 |                |
|----------------|-----------------|----------------|
|                | Initial(s)      | Date           |
| Inspected by:  | <u>BAB</u>      | <u>9-23-16</u> |
| Measured by:   | <u>BAB, kwn</u> | <u>9-23-16</u> |
| Calculated by: | <u>BAB</u>      | <u>9-23-16</u> |
| Checked by:    | <u>SM</u>       | <u>9-23-16</u> |

| Item Code # | Fund Code (Opt.) | Item                 | Location                | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|----------------------|-------------------------|--------------------|--|------------------|
| 25000400    |                  | NITROGEN FERT NUTR   | ENTIRE JOB ( 7.0 acres) | 700 LBS            | SEE GUARANTEED ANALYSIS FROM BAG           | ✓                |
|             |                  |                      |                         |                    | IN SEEDING FILE                            |                  |
| 25000500    |                  | PHOSPHORUS FERT NUTR | "                       | 420 LBS            | "  | ✓                |
|             |                  |                      |                         |                    |  |                  |
| 25000600    |                  | POTASSIUM FERT NUTR  | "                       | 280 LBS            | "  | ✓                |
|             |                  |                      |                         |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

✓ a final field measurement (item no.: 25000400, 25000500, 25000600 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Plans Require: N=100 lb/acre

Phos = 60 lb/acre

Pot = 40 lb/acre

Contractor delivered & used 140 bags of 10-6-4 @ 50 lb ea.

Quantity: Nit = 140 bags × 50 lbs × 10% = 700 lbs

(7.0 acre × 100 lb/acre = 700 lbs, yield is good)

Phos = 140 bags × 50 lbs × 6% = 420 lbs

(7.0 acre × 60 lb/acre = 420 lbs, yield is good)

Pot = 140 bags × 50 lbs × 4 % = 280 lbs

(7.0 acre × 40 lb/acre = 280 lbs, yield is good)

Fertilizer bags were counted & destroyed by Resident.



## PAVEMENT PATCHING 10

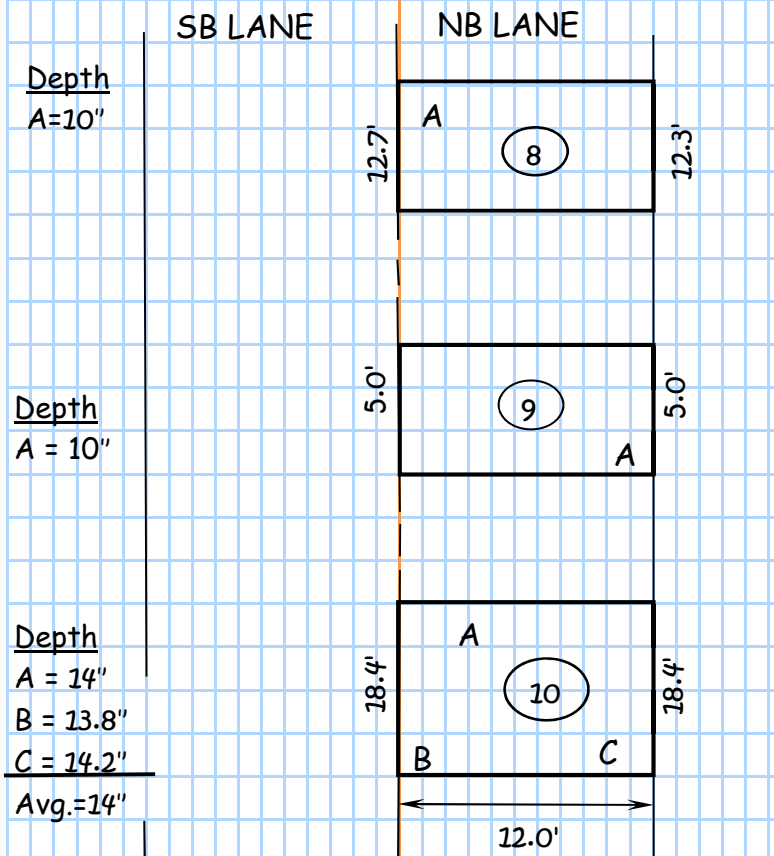
| Patch #      | 44200108<br>TYPE 2 | 44200112<br>TYPE 3 | CALCULATIONS  |
|--------------|--------------------|--------------------|---|
| ⑧<br>1241+02 |                    | 16.7               | $\frac{(12.7' + 12.3')}{2} \times 12.0 \times 1/9$<br><br>= 16.7 S.Y.   |
| ⑨<br>1241+98 | 6.7                |                    | $5.0 \times 12.0 \times 1/9 = 6.7 \text{ S.Y.}$   |
| ⑩<br>1246+00 |                    | 29.4               | $18.4 \times 12.0 \times 1/9 = 24.5 \text{ S.Y.}$<br>Patch Depth Increase<br>$= \frac{(14'' - 10'')}{10''} = 40\%$<br><br>•• Increase Qty. by 20%<br>•• Pay = $24.5 \times 1.20$<br>= 29.4 S.Y. |
| PAGE         |                    |                    |   |
| TOTALS       | 6.7 S.Y.           | 46.1 S.Y.          |   |

F.B. #1, Page 5

10-14-16

Clear, 60'S

ACE Construction



Evidence of Mat'l Insp: Plant Report, Tickets &amp; Test

Meas. By: VC, MD 10/14/16

Calc. By: VC 10/14/16



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 7-27-16

Contractor or Sub. ACME Construction

Weather Clear, 75°

Initial(s)

Date

Inspected by: RG, MF

7-27-16

Measured by: RG, MF

7-27-16

Calculated by: RG

7-27-16

Checked by: JR

7-27-16

| Item Code # | Fund Code (Opt.) | Item   | Location         | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|--|------------------|--------------------|--|------------------|
| 35400400    |                  | PCC BASE CSE W 9   | LT 0+25 to 23+50 |                    | Plant Report & Tickets & Test              |                  |
|             |                  |  | RT 0+25 to 10+20 | 1106.7 SY          |  |                  |
|             |                  | <b>NOTE:</b><br>Article 109.01 states that the pay width for pavement, base course, etc. shall be the exact horizontal dimension shown on the plans or ordered in writing by the Engineer. |                  |                    |  |                  |
|             |                  |  |                  |                    |  |                  |
|             |                  |  |                  |                    |  |                  |
|             |                  |  |                  |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 35400400 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

See Field Book #3  
Pg. 12-14 for field  
width and  
depth checks

LT 0+25 to 23+50

2325' × 3' × 1/9 = 775.0 SY

RT 0+25 to 10+20

995' × 3' × 1/9 = 331.7 SY

Total = 1106.7 SY



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date July 7, 2016

Contractor or Sub. ACME Const. Co.

Weather Cloudy, 83°

|                |                     |               |
|----------------|---------------------|---------------|
|                | Initial(s)          | Date          |
| Inspected by:  | <u>BAB</u>          | <u>7-7-16</u> |
| Measured by:   | <u>BAB &amp; AG</u> | <u>7-7-16</u> |
| Calculated by: | <u>BAB</u>          | <u>7-7-16</u> |
| Checked by:    | <u>SZJ</u>          | <u>7-7-16</u> |

| Item Code # | Fund Code (Opt.) | Item          | Location   | Quantity and Units | Evidence of Material Inspection | Posted in Q Book |
|-------------|------------------|---------------|------------|--------------------|---------------------------------|------------------|
| 51100100    |                  | Slope wall 4" | South Abut | 74.6 sy            | Plant Rpt. & Tickets & Test     | √                |
|             |                  |               |            |                    |                                 |                  |
|             |                  |               |            |                    |                                 |                  |
|             |                  |               |            |                    |                                 |                  |
|             |                  |               |            |                    |                                 |                  |
|             |                  |               |            |                    |                                 |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_)

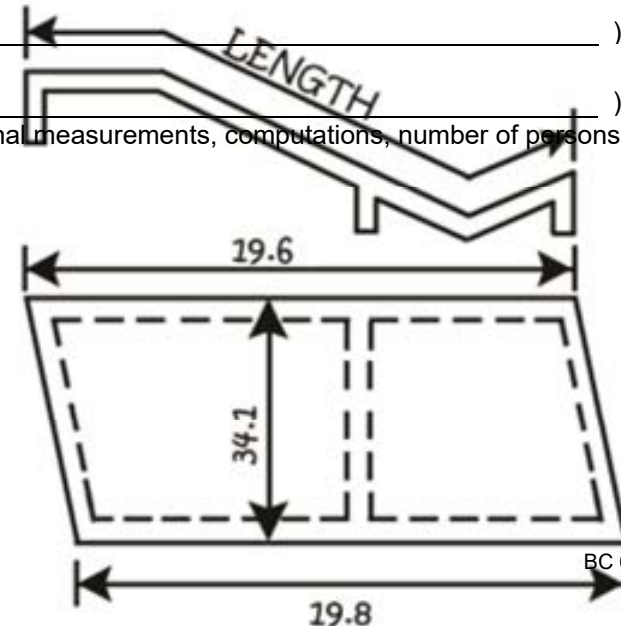
☒ a final field measurement (item no.: 51100100)

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

All measurements on upper slope  
surface of wall

$$\left( \frac{19.6 + 19.8}{2} \right) (34.1) \div 9 \frac{\text{sf}}{\text{sy}} = 74.6 \text{ sy}$$

See FB #4, p.12 for depth checks



BC 628 (Rev. 8/04)



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 10-5-16

Contractor or Sub. GREENSIDE UP

Weather SUNNY 79°

Initial(s)

Date

Inspected by: JAV

10-5-16

Measured by: JAV

10-5-16

Calculated by: JAV

10-5-16

Checked by: EF

10-6-16

| Item Code # | Fund Code (Opt.) | Item         | Location      | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|--------------|---------------|--------------------|--|------------------|
| 25200200    | W36U             | Supplemental | STA 461+00 TO | 24.5 Units         | Potable Source- Danville                   | √                |
|             |                  | Watering     | 493+00 RT     |                    | Municipal water supply                     |                  |
|             |                  |              |               |                    |  |                  |
|             |                  |              |               |                    |  |                  |
|             |                  |              |               |                    |  |                  |
|             |                  |              |               |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 25200200 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Per Art. 252.08, One initial watering of 5 gal/sy and 15 additional waterings at 3 gal/sy were applied, began supplemental watering today at 3 gal/sy over 8167 sy

Truck Plate → 3,500 Gallons/Load; 7 Loads Utilized Today

3500 gal/load × 7 loads = 24,500 Gal ÷ 1000 Gal/Unit = 24.5 Units



# Illinois Department of Transportation

## Inspector's Daily Report

County

Section

Route

District

Contract No.

Job No.

Project

**JOB  
STAMP**

Date 5-12-16

Contractor or Sub. GREENSIDE UP

Weather Sunny, 91°

|                |            |                |
|----------------|------------|----------------|
|                | Initial(s) | Date           |
| Inspected by:  | <u>GL</u>  | <u>5-12-16</u> |
| Measured by:   | <u>GL</u>  | <u>5-12-16</u> |
| Calculated by: | <u>GL</u>  | <u>5-12-16</u> |
| Checked by:    | <u>EG</u>  | <u>5-15-16</u> |

| Item Code # | Fund Code (Opt.) | Item      | Location        | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|-----------|-----------------|--------------------|--|------------------|
| 25301800    | W36U             | Seedlings | STA 26+50 LT to | 23.5 Units         | Letter Of Certification And                | DQ#              |
|             |                  |           | 26+59 LT        |                    | RE Vis (From Rhimes                        | 150              |
|             |                  |           |                 |                    | Nursery)                                   |                  |
|             |                  |           |                 |                    |  |                  |
|             |                  |           |                 |                    |  |                  |
|             |                  |           |                 |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: \_\_\_\_\_ )

☒ a final field measurement (item no.: 25301800 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

**Seedlings Tied In Bunches Of 30 Plants  
Counted 87 Bunches**

$$\text{Final QTY} = \frac{30 \text{ PLANTS/BUNCH} \times 87 \text{ BUNCHES}}{100 \text{ PLANTS/UNIT}} = 26.1 \text{ Units}$$

$$\text{Pay 90\% for planting on this date: } 26.1 \times 0.90 = 23.5 \text{ Units}$$

NOTE: Per Article 253.17 the remaining 10% of the pay quantity will be paid after the period of establishment (253.14) or upon execution and receipt of a third party performance bond.

## TREE REMOVAL

| LOCATION | CIRCUM<br>MEAS. | 20100110<br>6 - 15 | 20100210<br>> 15 | DATE<br>REMOVED |
|----------|-----------------|--------------------|------------------|-----------------|
| 613+65   | 53"             |                    | 16.9             | 8-18-16         |
| 614+10   | 21              | 6.7                |                  | "               |
| 614+28   | 28              | 8.9                |                  | "               |
| 614+80   | 38              | 12.1               |                  | "               |
| 616+25   | 58              |                    | 18.5             | "               |
| 616+38   | 30              | 9.5                |                  | "               |
| 616+73   | 48              |                    | 15.3             | "               |
| 617+28   | 74              |                    | 23.6             | 8-19-16         |
| 617+29   | 23              | 7.3                |                  | "               |
| 622+91   | 40              | 12.7               |                  | "               |
| 623+52   | 68              | <del>21.6</del>    | 21.6             | "               |
| 624+21   | 24              | 7.6                |                  | "               |
|          |                 | 64.8               | 95.9             |                 |
|          |                 | UNIT               | UNIT             |                 |
|          |                 | DIA.               | DIA.             |                 |

**NOTE:** Must note "Tree tape used" if a direct reading tree tape is used to determine the tree diameter.

## SUB-CONTRACTOR: R &amp; W TREE SERVICE

| DATE    | 6-15 | >15  | INSP. BY | WEATHER    |
|---------|------|------|----------|------------|
| 8/18/16 | 37.2 | 50.7 | EAL      | SUNNY, 76° |
| 8/19/16 | 27.6 | 45.2 | EAL      | SUNNY, 80° |

Example conversion calculation from circumference measurement in inches to unit diameter:

STA 613+65:  $53" \div 3.1416 = 16.9$  unit diameter

Measured By: MRL 8/16/16  
 Calculated By: MRL 8/19/16  
 Checked By: VMC 8/19/16

Contract # 60V20

X4060110

BIT. MATERIALS (PRIME COAT)

IL 173

FROM COUNTY LINE  
TO FLAT IRON RD.

0°C \*

31,200.00 +

21,420.00 -

9,780.00 \*

51,880.00 +

22,234.00 +

74,114.00 \*

51,880.00 ÷

74,114.00 =

0.70 \*

9,780.00 x

0.70 =

6,846.00 \*

6,846.00 x

0.638 =

TOTAL = 4,367.75 \*

LBS.

Initial(s) Date

EAL 10/6/16

MSL 10/6/16

Measured by:

Calculated by

Checked by



## Ticket Tape Calculations for Emulsions with Added Water

.....Weight before application - from prime coat ticket

.....Weight after application - from prime coat weigh-back ticket

.....Net weight of emulsion used on job (includes all added water)

.....Tanker weight of emulsion - shown on the bill of lading

.....Weight of water added to emulsion – shown on bill of lading

.....Total weight of the diluted emulsion mixture

.....Tanker weight of emulsion shown on bill of lading

.....Total weight of the diluted emulsion mixture

.....70% - percent of emulsion in the pressure distributor

.....Weight of emulsion used on job (includes all added water)

.....70% - percent of emulsion in the pressure distributor

.....Pounds of emulsion

.....Pounds of emulsion

.....% of residual asphalt in the emulsion from the bill of lading

.....**Pounds of residual asphalt – this is what you pay!**

Contract # 60V20

X4060110

BIT. MATERIALS (PRIME COAT)

IL 173

FROM COUNTY LINE

TO FLAT IRON RD.



## Ticket Tape Calculations for Emulsions with NO Added Water and for Cutbacks

| Initials) | Date    |
|-----------|---------|
| EAL       | 10/6/16 |
| MSL       | 10/6/16 |

Measured by:  
Calculated by  
Checked by

|         |             |
|---------|-------------|
|         | 0.00 *      |
|         | 31,200.00 + |
|         | 21,420.00 - |
|         | 9,780.00 *  |
|         | 9,780.00 x  |
|         | 0.638 =     |
| TOTAL = | 6,239.64 *  |
|         | LBS.        |

.....Weight before application - From prime coat ticket

.....Weight after application - From prime coat weigh-back ticket

.....Net weight – Total pounds of cutback or emulsion used on job

.....Pounds of cutback or emulsion

.....% of residual asphalt from the bill of lading

.....**Pounds of residual asphalt – this is what you pay!**





# Inspector's Daily Report

County

Section

Route

District

Contract No. 70X01

Job No.

Project

Date 9/21/2017

Contractor or Sub. ACME Construction

Weather 80's P Cloudy

|                | Initial(s) | Date      |
|----------------|------------|-----------|
| Inspected by:  | GJR        | 9/21/2017 |
| Measured by:   | GJR        | 9/21/2017 |
| Calculated by: | MLK        | 9/21/2017 |
| Checked by:    | JMN        | 9/22/2017 |

| Item Code # | Fund Code (Opt.) | Item           | Location     | Quantity and Units | Evidence of Material Inspection (Optional) | Posted in Q Book |
|-------------|------------------|----------------|--------------|--------------------|--|------------------|
| 44003100    |                  | MEDIAN REMOVAL | Sta 59+00 Rt | 229.0 SF           | N/A  |                  |
|             |                  |                |              |                    |  |                  |
|             |                  |                |              |                    |  |                  |
|             |                  |                |              |                    |  |                  |
|             |                  |                |              |                    |  |                  |
|             |                  |                |              |                    |  |                  |

This is: ☐ an estimated progress measurement (item no.: )

☒ a final field measurement (item no.: 44003100 )

Remarks: (e.g., instruction to Contractor, special problems, sketches with dimensions for final measurements, computations, number of persons working, hours worked) Use reverse side, if needed.

Used Cogo Area Calculation Tool from Trimble Access Version 2016.03. Area calculated from a list of coordinate points shot around the perimeter.

See attached print out of area calculation (Attachment A1).

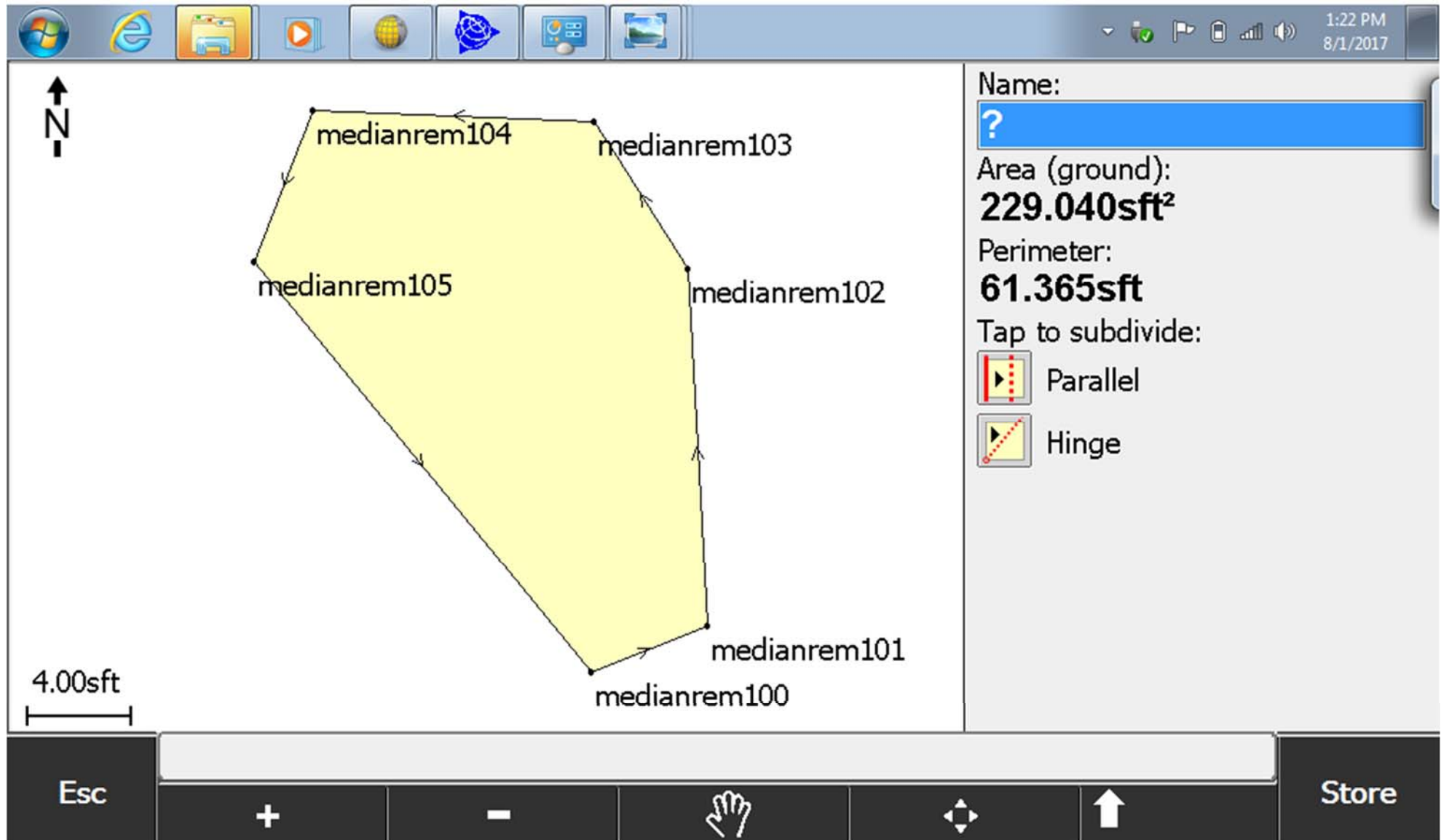
See attached print out of point list: medianrem100 to medianrem105 (Attachment A2). Point selection indicated by a checkmark.

See attached print out of coordinates: medianrem100 to medianrem105 (Attachment A3).

Measured quantity compares to plan quantity of 228.5 SF as shown on Sheet 42 of the plans.

# Field Measurements with Electronic Devices

Attachment A1 – (See Median Removal IDR on Page F-73)



# Field Measurements with Electronic Devices

Attachment A2 – (See Median Removal IDR on Page F-73)

Windows taskbar icons: Internet Explorer, File Explorer, Media Center, Windows Update, and a globe icon. System tray shows time 1:08 PM, date 8/1/2017, and icons for network, battery, and volume.

| Name                    | Code |
|-------------------------|------|
| ✓ × medianrem100        |      |
| ✓ × medianrem101        |      |
| ✓ × medianrem102        |      |
| ✓ × medianrem103        |      |
| ✓ × medianrem104        |      |
| ✓ × <b>medianrem105</b> |      |
| × curbrem100            |      |
| × curbrem101            |      |
| × curbrem102            |      |
| × curbrem103            |      |
| × curbrem104            |      |
| × curbrem105            |      |

Right sidebar status: Battery 62%, 74%, Satellite icon, 14, Two antenna icons, ?

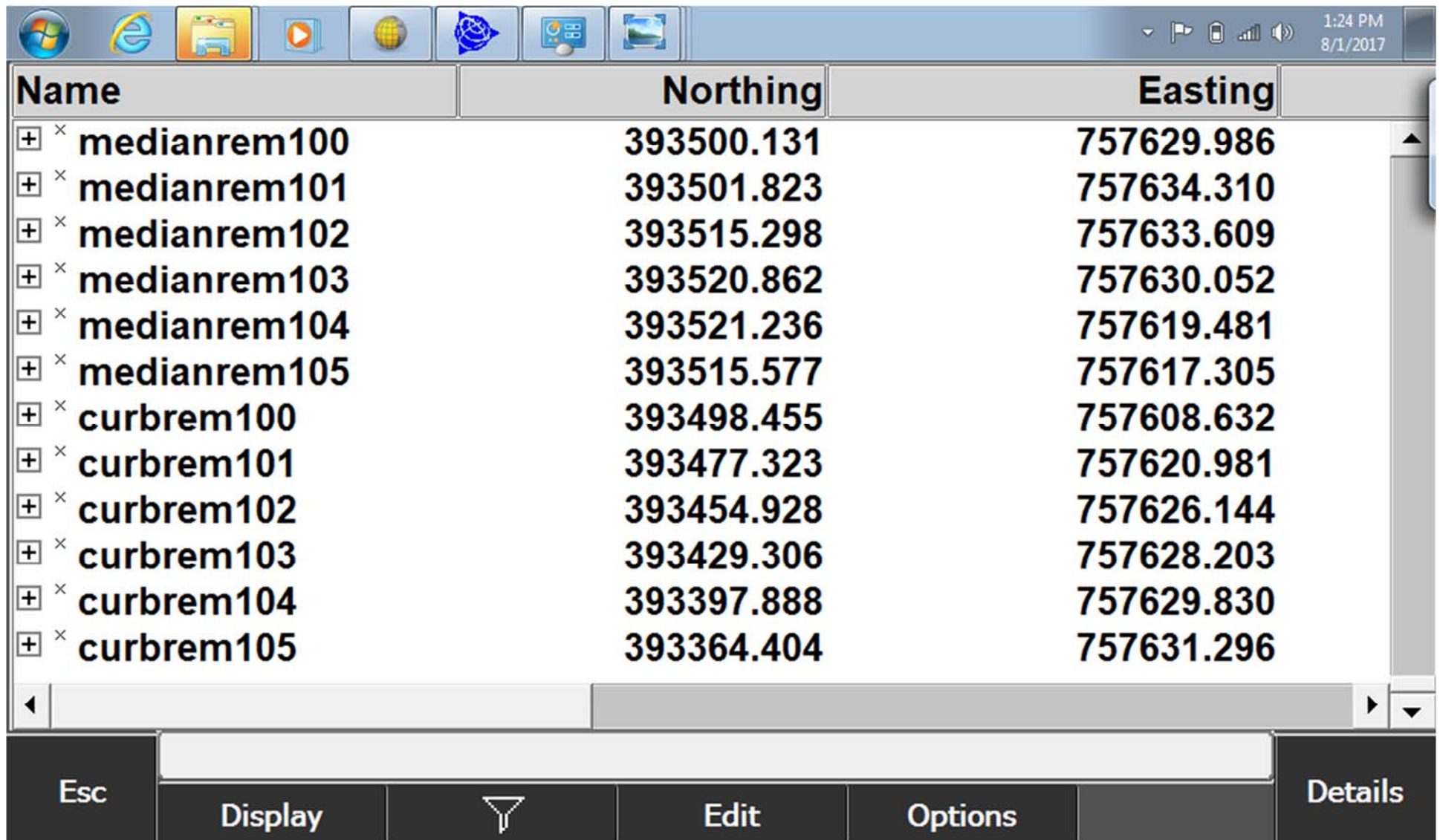
Buttons: Map, Menu, Favorites, Switch to

Bottom status bar: No survey PDOP:1.5

Bottom navigation bar: Esc, All, None, Filter, Calc

# Field Measurements with Electronic Devices

Attachment A3 – (See Median Removal IDR on Page F-73)



The screenshot shows a handheld electronic device screen displaying a data table. The table has three columns: Name, Northing, and Easting. The data is organized into two groups: medianrem and curbrem. Each group contains five entries, numbered 100 through 105. The Northing and Easting values are numerical coordinates. The device's interface includes a taskbar at the top with various icons and a menu bar at the bottom with options like Esc, Display, Edit, Options, and Details.

| Name             | Northing   | Easting    |
|------------------|------------|------------|
| + x medianrem100 | 393500.131 | 757629.986 |
| + x medianrem101 | 393501.823 | 757634.310 |
| + x medianrem102 | 393515.298 | 757633.609 |
| + x medianrem103 | 393520.862 | 757630.052 |
| + x medianrem104 | 393521.236 | 757619.481 |
| + x medianrem105 | 393515.577 | 757617.305 |
| + x curbrem100   | 393498.455 | 757608.632 |
| + x curbrem101   | 393477.323 | 757620.981 |
| + x curbrem102   | 393454.928 | 757626.144 |
| + x curbrem103   | 393429.306 | 757628.203 |
| + x curbrem104   | 393397.888 | 757629.830 |
| + x curbrem105   | 393364.404 | 757631.296 |



Illinois Department of Transportation

# **DOCUMENTATION APPENDIX**

SPECIFIC TASK TRAINING PROGRAM

*Conducted by the*  
ILLINOIS CENTER FOR TRANSPORTATION (ICT)  
AND  
IDOT BUREAU OF CONSTRUCTION

**FY 2026**



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# **CURRENT CONSTRUCTION MANUAL**

## **Table of Contents**

### **(March 2021)**

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| Document Control & Revision History  | Appendices   |
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## IDOT Inspector Checklist Link

### Inspector Checklist

Construction Inspector's Checklists are issued by IDOT's Bureau of Construction to provide guidance to IDOT and local agency employees for the performance of required inspection for the major categories of work involved in department contracts.

For technical support call (217) 782-2760.

| Checklist   | Revision   |
|---|------------|
| <a href="#">Bridge Superstructures</a>                          | 01/03/2018 |
| <a href="#">Concrete Structures Other Than Bridge Decks</a>     | 03/01/2013 |
| <a href="#">Continuously Reinforced PCC Pavement</a>            | 12/14/2007 |
| <a href="#">Contract Administration</a>                         | 08/27/2025 |
| <a href="#">Drilled Shafts</a>                                  | 07/08/2025 |
| <a href="#">Earth Excavation and Embankment</a>                 | 08/27/2025 |
| <a href="#">Erosion Control</a>                                 | 07/08/2025 |
| <a href="#">Hot Mix Asphalt (HMA) Binder and Surface Course</a> | 12/14/2007 |
| <a href="#">Hot Mix Asphalt (HMA) Pavement (Full Depth)</a>     | 12/14/2007 |
| <a href="#">Hot Mix Asphalt (HMA) Shoulders</a>                 | 12/14/2007 |
| <a href="#">Pavement Patching</a>                               | 05/21/2025 |
| <a href="#">Piling</a>  | 05/21/2025 |
| <a href="#">Pipe Culverts</a>                                   | 05/21/2025 |
| <a href="#">Portland Cement Concrete Pavement</a>               | 07/14/2025 |
| <a href="#">Precast Concrete Box Culverts</a>                   | 07/14/2025 |
| <a href="#">Removal and Disposal of Regulated Substances</a>    | 07/08/2025 |
| <a href="#">Roadway Lighting</a>                                | 05/25/2018 |
| <a href="#">Soil Modification</a>                               | 05/21/2025 |
| <a href="#">Stabilized Subbase, HMA &amp; CAM II</a>            | 05/21/2025 |
| <a href="#">Storm Sewers</a>                                    | 05/21/2025 |
| <a href="#">Structural Steel Bolting</a>                        | 05/21/2025 |
| <a href="#">Traffic Signal Installation</a>                     | 12/14/2007 |

State of Illinois  
Department of Transportation

**CONSTRUCTION INSPECTOR'S CHECKLIST  
FOR  
CONTRACT ADMINISTRATION**

While its use is not required, this checklist has been prepared to provide the Resident Engineer a summary of easy-to-read step-by-step requirements relative to Contract Administration. The following questions are based on information found in the Standard Specifications for Road and Bridge Construction, Construction Manual, Policy Memorandums, and letters.

**BEGINNING OF CONTRACT**

1. Have you received from your Construction Office the following? All items may already be placed in CMMS.

Special Provisions  
Plans  
Copy of executed contract (i.e. signed by the Secretary of Transportation)  
Commitment File  
Copy of Joint Agreements and Letters of Understanding  
404 Permits, etc.  
NPDES Plan & NOI  
Design calculations.  
ROW plats for any proposed ROW or easements.  
Contract Award Report First pay estimate – Mobilization  
Subcontractor Approvals  
Approved material sources

2. Establish contract files that includes the following as a suggested minimum? (\* - Items in CMMS and a file may not be needed)

|                              |  |
|------------------------------|--|
| As Built Plans               | Binder for IDR's, <a href="#">BC 628</a>             |
| Asphalt and Concrete Reports | Material Inspection Reports - <a href="#">MIRC08</a> |
| Audit Reviews                | Miscellaneous  |
| Authorizations *             | NPDES Reports  |
| Calculations                 | Pay Estimates / Material Allowance *                 |
| Commitments                  | Proportioning Reports - Plant Reports                |
| Contract *                   | QC/QA Plan, Reports                                  |
| Contractor's Payroll (LCP    | Shop Drawings  |
| Tracker)Correspondence       | Subcontractor Approvals *Delivery Ticket             |
| EEO Reports                  | Files/Envelopes                                      |
| Erosion Control Reports      | Traffic Control Reports *                            |
| Final Papers                 | Trainee Reports                                      |
| Force Account Reports        | Weekly Reports *                                     |

3. Are you setting up the following documents?
  - a. Quantity Book. Verify all quantities have been loaded into CMMS, including Fund Key(s)..
  - b. Binder for Inspector's Daily Reports, for any IDR's prepared during the project. See Section F of the Documentation of Contract Quantities Manual.
  - c. Field Books. Put identifying information on any field books to be used. See Section F of the Documentation of Contract Quantities Manual.
  - d. Diary. The Diary will be completed in CMMS. Weekly Reports can be generated from the Diary in CMMS..
4. Have you been informed as to when and where the Pre-Construction Conference will be held?
  - a. Pick up several sets of plans and special provisions, and order full scale sized sets if it is a major project.
  - b. Have your key personnel attend this meeting (with Supervisor's permission).
  - c. Keep a copy of the minutes in your contract file.
  - d. Discuss any agreement to plan quantity (BC 981).
  - e. Scheduled jobsite inspection to review and designate the locations and types of erosion control protection to be placed. (See Art. 280.03)
  - f. Discuss material sources and suppliers.
  - g. Discuss progress schedule submittal and start of work. See Section 108 of the Standard Specifications.
  - h. Discuss the proposed workforce and equipment to be used. See Section 108 of the Standard Specifications.
5. Have you contacted the designer and discussed this contract?
  - a. Obtain a copy of the Design Calculations for future reference. They show how the plan quantities were determined.
  - b. If the project involves rehabilitation, obtain a set of current as built plans from microfilm.
6. Have you discussed the following concerning this contract with your supervisor?

- a. Personnel requirements.
  - b. Vehicles.
  - c. Survey and measurement equipment.
  - d. CMMS contract upload
  - e. Material testing equipment.
  - f. Authorization pre-approvals.
  - g. Special commitments.
7. Have you discussed with the Contractor the location of the field office and given him/her a list of any special equipment required by the contract?  
See Section 670 of the Standard Specifications.  
  
Provide the exact location of the field office and the field office phone numbers to your District Construction office.
8. Are you and your staff carefully examining the plans, Special Provisions, Recurring Special Provisions, Supplemental Specifications and Specifications? Any discrepancies shall be reconciled in accordance with Article 105.05.
9. Does your contract contain a temporary erosion control plan? If not, have you discussed this with the Contractor and your Landscape Architect?  
Follow the Construction Inspector's Checklist for Erosion Control.
10. Has the Traffic Control Authorization Request Form [BSPE](#) 725 been prepared, submitted and approved?
11. Are you checking the list of Construction Memorandums to see if any apply to your contract? (Note: Construction Memorandums are not contract documents. Construction Memorandums are policy.)
12. Review the standard forms necessary for documentation along with pertinent guidelines such as who prepares the form, the purpose of the form, instructions on its preparation and distribution?
13. Prior to the contractor starting work, have you:
  - a. Received a satisfactory progress schedule from the contractor?  
(See Art. 108.02)
  - b. Received approval for first or second-tier subcontractors the contractor has requested to use on the project?
  - c. Determine if original cross sections are needed for earthwork?

- d. Measured items to be removed? (e.g. trees)
  - e. Established benchmarks needed for the work?
  - f. Conducted the jobsite erosion control review scheduled at the pre-construction conference. (See Art. 280.03)
  - g. Prior to commencing earthwork, installed Erosion and Sediment Control measures. (See Art. 280.03)
14. Are you determining the ROW limits and any construction easements and marking them for the contractor. (See Art. 107.32)
- a. In some cases, it may be necessary to contact your District Land Acquisition Office to obtain the ROW plats.
  - b. See Section 100 in the Construction manual.
15. Are you establishing stationing throughout the project?
- Sometimes it is advantageous to run an offset line other than the centerline especially in urban areas.
16. Are you locating the stations of all permanent signs, no passing zones, special pavement markings, etc.?
- Note:** The Bureau of Operations have the signs inventoried by mile stations.
17. Are you discussing the traffic control plan with the Contractor? (Section 700)
- a. Read Section 700 in the Standard Specifications.
  - b. Contact your District Traffic Control Supervisor and discuss any recent specification changes. Ask if State Police hireback money is available for your project. Have him/her inspect the initial traffic control setup for specification compliance.

#### PROSECUTION AND PROGRESS OF CONTRACT

1. Are you making out a Pay Estimate at least once a month of the materials in place complete, the amount of work performed, and the value thereof, at the contract unit prices? (See Art. 109.07)
- a. Enter the cumulative quantity from the quantity book not to exceed the plan quantity or authorized quantity on the corresponding line item of the pay estimate.
  - b. Refer to Section 109.07 of the Construction Manual for specific procedures.

- c. Do not include on the pay estimate quantities which do not have evidence of material inspection. Consult your District Materials office.
- 2. Are you performing erosion control inspections as required and ensuring the erosion control plan is being followed by the Contractor?
  - a. Follow the Construction Inspector's Checklist for Erosion Control.
  - b. See Section 280 of the Construction Manual.
- 3. Are you filling out the Diary daily in CMMS? (See Art. 108.04)
  - a. A Weekly Report can be generated in CMMS. The progress and status of each contract in every district statewide can be tracked in the CMMS Diary.
  - b. Discuss the progress of the work with the Contractor and compare it to the progress schedule. (See Art. 108.02)
  - c. Extension of time requests can be initiated by either the contractor or Engineer. (See Art. 108.08) (Form BC-2019)
  - d. See Section 108 of the Construction Manual.
- 4. Are you performing traffic control inspections as required by Section 700 in the Construction Manual?

Coordinate through your District Traffic Control Supervisor from the Bureau of Operations.
- 5. Are you ensuring all materials incorporated into the work has evidence of Material Inspection?
  - a. Contact your District Bureau of Materials.
  - b. Follow the requirements of the Project Procedures Guide.
- 6. Are you completing Contractor evaluations on a annual basis on Form BC 1777, Contractor's Performance Evaluation?
  - a. This form is used to help determine the prequalification Work Rating of a Contractor.
- 7. Are all field books set up as outlined in Section F in the Documentation of Contract Quantities Manual?
  - a. Do not leave field books in drawers or State trucks.

- b. Are daily bituminous, concrete and piling notes being recorded in hard-backed field books?
- 8. Are Truck Tare Weights being recorded daily on pay items paid for by the ton?
  - a. See Section F in the Documentation of Contract Quantities Manual, Documentation of Pay Quantities Based on Weight Tickets.
  - b. Use form BC 1465, Truck Tare Weights.
  - c. Are independent weight checks being conducted. See Special Provision and Documentation of Contract Quantities Manual.
- 9. For Extra Work are you filling out daily copies of Form BC 635, Extra Work Daily Report or establishing an agreed unit price for the work? (See Article 109.04)
  - a. Form BC 635 must be jointly signed by the Resident (or inspector) and the Contractor, recording labor, equipment, and material used. See Construction Memorandum No. 4.
  - b. Agreed unit prices require a letter from the Contractor and a memorandum from the District Estimator. See Section A in the Documentation of Contract Quantities Manual.
  - c. If prior approval from supervisor (or higher) was required, record in the project diary the name of the person and when the approval was received
- 10. Are you ensuring that the Contractor is complying with all the EEO requirements? Are you periodically making spot interviews of employees of the Contractor and subcontractor(s) on the job to establish that the minimum wage and other labor standards of the contract are being fully complied with and that there is no misclassification of labor or disproportional employment of apprentices, etc.?
  - a. See Construction Memorandum No. 24 and EEO Checklist, Form SBE 1008..
  - b. Use Form BC 163, Report Of Employee Interviews.
  - c. See Checksheet #4, Required Provisions - State Contracts.
  - d. Interview one employee from each craft.
  - e. Compare the wage rates to the Illinois Department of Labor's prevailing wage list for the appropriate county(s) contained in each contract.
  - f. Report discrepancies to your supervisor and District EEO Officer.



11. Are you documenting thickness for items as indicated on the Thickness Determination Schedule contained in Section A of the Documentation of Contract Quantities Manual?

### END OF CONTRACT

1. Are you checking the plans to be sure all work was performed under the contract?
2. Are you giving the Contractor a punch list of items to be completed before the project can be accepted?

Make a joint inspection with either the Maintenance Field Engineer or Field Technician.

3. Are you performing final documentation as indicated in Section A in the Documentation of Contract Quantities Manual?

See Form BC 111, Checklist For Engineer's Final Payment Estimate.

4. If the contractor wishes to submit a claim on this contract, is he/she following the procedures outlined in Article 109.09?

Refer to Section 109.09 of the Construction Manual.

5. Are you preparing an As-Built sets of plans for this contract?
  - a. Use 1/4 size plan sheets and mark changes in green or blue (red pencil does not copy well).
  - b. Make two sets for contracts that involve changes or revisions to bridge plans.

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## IDOT Construction Memorandums Link

# Construction Memorandums

Construction Memorandums are issued by IDOT's Bureau of Construction to distribute policy information.

**Special Instructions:** The current memos are available for download. Users can download individual memos or all memos. To download an individual file to your hard drive click the link with the right mouse button, then choose "save target as." To view the file, click the link with the left mouse button. An index with links to all the current memos is also available. After downloading, the memo files and the index must be placed in the same directory.

Files are in Adobe PDF format. Adobe Reader is required to view these files.

Search

Q

Filters

Filter Table

Clear Filters

| TITLE              | ↑ | DESCRIPTION   | ASSET DATE |
|--------------------|---|---|------------|
| <a href="#">1</a>  |   | Purpose of Construction Memorandums, Index and Extension of Expiration Dates                                      | 11/23/2003 |
| <a href="#">14</a> |   | Labor Compliance - Federal-Aid Highway Projects   | 08/22/2019 |
| <a href="#">22</a> |   | Procedures for Applying the Bituminous Materials Cost Adjustment  | 02/28/2009 |
| <a href="#">24</a> |   | Equal Employment Opportunity Contract Provisions and District Responsibilities                                    | 02/28/2006 |
| <a href="#">30</a> |   | Policies and Procedures for Approval of Subcontractors  | 12/11/2019 |
| <a href="#">33</a> |   | Operational Review of Contract Quantities   | 04/30/2012 |
| <a href="#">39</a> |   | Transportation or Operation of Heavy Equipment on Pavement or Bridges Within the Contract Limits - Article 107.16 | 03/31/2006 |
| <a href="#">4</a>  |   | Authorization of Contract Changes   | 09/09/2020 |
| <a href="#">40</a> |   | Rubblizing PCC Pavement and Placing a Bituminous Concrete Overlay   | 05/31/2001 |
| <a href="#">46</a> |   | Field Control of Railroad and Utility Adjustments   | 06/03/2002 |

Showing 1 to 10 of 28 entries

Previous

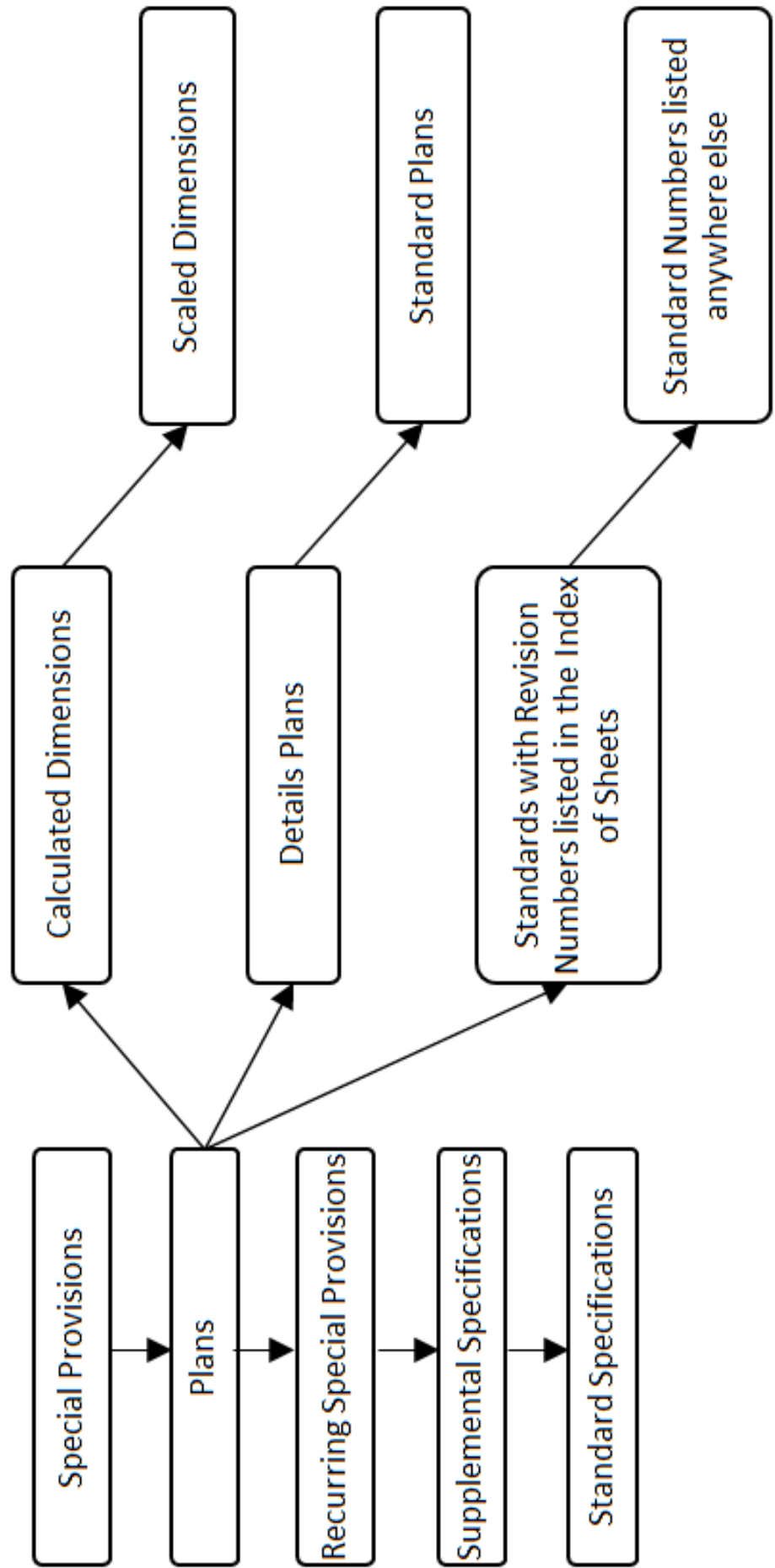
1

2

3

Next

# Coordination of Contract Documents - Art. 105.05



# 46

## RETURN WITH BID

|                       |
|-----------------------|
| Proposal Submitted By |
| Name                  |
| Address               |
| City                  |

Letting April 22, 2016

### NOTICE TO PROSPECTIVE BIDDERS

This proposal can be used for bidding purposes by only those companies that request and receive written AUTHORIZATION TO BID from IDOT's Central Bureau of Construction.  
BIDDERS NEED NOT RETURN THE ENTIRE PROPOSAL

# Notice to Bidders, Specifications, Proposal, Contract and Contract Bond



**Illinois Department  
of Transportation**

Springfield, Illinois 62764

**Contract No. 70767  
MCLEAN County  
Section (57-20,57-1)RS&56RS-3  
Route FAP 730,FAP 322  
Project ACNHPP-000V(048)  
District 5 Construction Funds**

PLEASE MARK THE APPROPRIATE BOX BELOW:

- ☐ A Bid Bond is included.
- ☐ A Cashier's Check or a Certified Check is included
- ☐ An Annual Bid Bond is included or is on file with IDOT.

Prepared by

Checked by

F

(Printed by authority of the State of Illinois)

| COUNTY NAME/CODE     | SECTION               | PROJECT NUMBER | ROUTE(S)        |             |                            |
|----------------------|-----------------------|----------------|-----------------|-------------|----------------------------|
| CHAMPAIGN /019       | (10-33HB)BDR          |                | FAI 57          |             |                            |
| PAY ITEM NBR         | PAY ITEM DESCRIPTION  | QUANTITY       | UNIT OF MEASURE | UNIT PRICE  | TOTAL PAY ITEM AWARD PRICE |
| X7015005             | CHANGEABLE MESSAGE SN | 24.000         | CAL DA          | 75.0000     | 1,800.00                   |
| Z0012130             | BR DECK SCAR 3/4      | 584.000        | SQ YD           | 49.0000     | 28,616.00                  |
| Z0012162             | BR DK MIC C OVL 2 1/4 | 584.000        | SQ YD           | 68.0000     | 39,712.00                  |
| Z0015595             | DECK DRAIN EXTENSIONS | 8.000          | EACH            | 965.0000    | 7,720.00                   |
| Z0015802             | PLUG EX DK DRAINS     | 16.000         | EACH            | 195.0000    | 3,120.00                   |
| Z0016002             | DECK SLAB REP (FD-T2) | 9.700          | SQ YD           | 1,552.0000  | 15,054.40                  |
| Z0016702             | DETOUR SIGNING        | 1.000          | L SUM           | 9,057.0000  | 9,057.00                   |
| Z0041895             | POLYMER CONCRETE      | 2.300          | CU FT           | 1,102.0000  | 2,534.60                   |
| 40600100             | BIT MATLS PR CT       | 53.000         | GALLON          | 2.0000      | 106.00                     |
| 40600982             | HMA SURF REM BUTT JT  | 160.000        | SQ YD           | 11.0000     | 1,760.00                   |
| 40603335             | HMA SC "D" N50        | 45.000         | TON             | 260.0000    | 11,700.00                  |
| 44201769             | CL D PATCH T3 10      | 36.000         | SQ YD           | 340.0000    | 12,240.00                  |
| 50102400             | CONC REM              | 12.300         | CU YD           | 1,639.0000  | 20,159.70                  |
| 50157300             | PROTECTIVE SHIELD     | 213.000        | SQ YD           | 70.0000     | 14,910.00                  |
| 50300255             | CONC SUP-STR          | 12.300         | CU YD           | 1,780.0000  | 21,894.00                  |
| 50300260             | BR DECK GROOVING      | 533.000        | SQ YD           | 10.0000     | 5,330.00                   |
| 50300300             | PROTECTIVE COAT       | 38.000         | SQ YD           | 6.0000      | 228.00                     |
| 50800205             | REINF BARS, EPOXY CTD | 300.000        | POUND           | 8.0000      | 2,400.00                   |
| 50900200             | STEEL RAIL TYPE 2399  | 435.000        | FOOT            | 111.0000    | 48,285.00                  |
| 63000001             | SPBGR TY A 6FT POSTS  | 2,037.500      | FOOT            | 18.6500     | 37,999.38                  |
| 63100087             | TRAF BAR TERM T6A     | 4.000          | EACH            | 3,000.0000  | 12,000.00                  |
| 63100167             | TR BAR TRM T1 SPL TAN | 4.000          | EACH            | 2,270.0000  | 9,080.00                   |
| 63200310             | GUARDRAIL REMOV       | 2,325.000      | FOOT            | 3.0000      | 6,975.00                   |
| 66101150             | HMA SHLD CURB         | 125.000        | FOOT            | 25.0000     | 3,125.00                   |
| 67100100             | MOBILIZATION          | 1.000          | L SUM           | 65,150.7500 | 65,150.75                  |
| 70100700             | TRAF CONT-PROT 701406 | 1.000          | L SUM           | 27,000.0000 | 27,000.00                  |
| 78001110             | PAINT PVT MK LINE 4   | 1,700.000      | FOOT            | 0.5000      | 850.00                     |
| 78200410             | GUARDRAIL MKR TYPE A  | 36.000         | EACH            | 8.5000      | 306.00                     |
| 78201000             | TERMINAL MARKER - DA  | 4.000          | EACH            | 35.0000     | 140.00                     |
| CONTRACT TOTAL AWARD |                       |                |                 |             | 409,252.83                 |

# Item Number Designation

- The first three numbers show the Section of Standard Specs.

- Letter prefix has special meaning

- "A" through "K" indicate plant & landscape items
- "M" indicates a metric pay item on a metric project
- "X" indicates a special provision or general note has modified the item from the Standard Specs.
- "Z" indicates an item shown only in the Special Provisions
- "XZ" indicates pay items that were created for special circumstances which may be used with special provision or general note for clarification

| PAY<br>NBR | ITEM | PAY                   | ITEM DESCRIPTION |
|------------|------|-----------------------|------------------|
| X7015005   |      | CHANGEABLE MESSAGE    | SN               |
| Z0012130   |      | BR DECK SCAR          | 3/4              |
| Z0012162   |      | BR DK MIC C OVL       | 2 1/4            |
| Z0015595   |      | DECK DRAIN EXTENSIONS |                  |
| Z0015802   |      | PLUG EX DK DRAINS     |                  |
| Z0016002   |      | DECK SLAB REP (FD-T2) |                  |
| Z0016702   |      | DETOUR SIGNING        |                  |
| Z0041895   |      | POLYMER CONCRETE      |                  |
| 40600100   |      | BIT MATLS PR CT       |                  |
| 40600982   |      | HMA SURF REM BUTT JT  |                  |
| 40603335   |      | HMA SC "D"            | N50              |

**CHANGEABLE MESSAGE SIGN**  
Eff. 03-23-2004

Rev. 01-01-2014

This work shall consist of furnishing, placing, and maintaining changeable message sign(s) at the location(s) shown on the plans or as directed by the Engineer.

The sign(s) shall be trailer mounted. The message panel shall be at least 7 ft (2.1 m) above the pavement, present a level appearance, and be capable of displaying up to eight characters in each of three lines at a time. Character height shall be 18 inches (450 mm).

The message panel shall be of either a bulb matrix or disc matrix design controlled by an onboard computer capable of storing a minimum of 99 programmed messages for instant recall. The computer shall be capable of being programmed to accept messages created by the operator via an alpha-numeric keyboard and able to flash any six messages in sequence. The message panel shall also be capable of being controlled by a computer from a remote location via a cellular linkage. The Contractor shall supply the modem, the cellular phone, and the necessary software to run the sign from a remote computer at a location designated by the Engineer. The Contractor shall promptly program and/or reprogram the computer to provide the messages as directed by the Engineer.

The message panel shall be visible from ¼ mile (400 m) under both day and night conditions. The letters shall be legible from 750 ft (250 m).

The sign shall include automatic dimming for nighttime operation and a power supply capable of providing 24 hours of uninterrupted service.

The Contractor shall provide all preventive maintenance efforts s(he) deems necessary to achieve uninterrupted service. If service is interrupted for any cause and not restored within 24 hours, the Engineer will cause such work to be performed as may be necessary to provide this service. The cost of such work shall be borne by the Contractor or deducted from current or future compensation due the Contractor.

When the sign(s) are displaying messages, they shall be considered a traffic control device. At all times when no message is displayed, they shall be considered equipment.

Basis of Payment: When portable changeable message signs are shown on the Standard, this work will not be paid for separately, but shall be considered as included in the cost of the Standard.

For all other portable changeable message signs, this work will be paid for at the contract unit price per CALENDAR DAY for CHANGEABLE MESSAGE SIGN. Any portion of one calendar day during which the sign is operated as directed by the Engineer shall be paid as one full calendar day.

**X7015005**

**“X” item number**



## **ADJUSTING OF FRAMES AND GRATES OF DRAINAGE AND UTILITY STRUCTURES**

Eff.: 03-09-2001

Rev.: 03-28-2007

At the contractor's option the adjustment of the casting may be performed after the surface course has been placed.

If this option is chosen, the existing pavement adjacent to and for a distance not exceeding 12 inches (300 mm) outside the base of the casting to be adjusted shall be broken sufficiently to permit its removal.

After the casting has been adjusted, the pavement and hot-mix asphalt mixture removed shall be replaced with Class SI concrete not less than 9 inches (225 mm) thick. The concrete surface to a depth of 1 inch (25 mm) shall be darkened with a mortar additive to match the adjacent hot-mix asphalt mixture.

Payment will be in accordance with Articles 602.16 or 603.09.

### **CONCRETE CURB REPAIR**

Description: This work shall consist of removal and replacement of concrete curb at locations determined by the Engineer.

Construction Requirements: This work shall be completed according to the applicable portions of Section 440 and Section 606 of the Standard Specifications, and as directed by the Engineer. The minimum length of the curb repair shall be four feet. The minimum length of existing curb to be left in place between areas shall be ten feet. Joints in concrete gutter, curb and combination curb and gutter shall be constructed as a continuation of the joints in the adjacent concrete pavement, base course, base course widening, shoulder. Expansion joints adjacent to drainage castings may be placed in prolongation with other joint types. When concrete curb and combination curb and gutter are constructed adjacent to flexible Pavement or shoulders, joints shall be constructed at distances in accordance with existing joints.

Basis of Payment: This work will be paid for at the contractors unit price per foot measured in place for CONCRETE CURB REPAIR, which the price shall include the removal and disposal of the existing curb and reinforcement bars, as well as seeding and shaping any soil disturbed in order to perform said work.

**Z0012500**

**“Z” item number**

## STATE OF ILLINOIS

### SPECIAL PROVISIONS

The following ~~Special Provisions~~ supplement the "Standard Specifications for Road and Bridge Construction, **Adopted April 1, 2016**", the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the "Supplemental Specifications and Recurring Special Provisions" indicated on the Check Sheet included herein, which apply to and govern the construction of FAP Routes 730 & 322 (US 51 & US 51 BUS), Project ACNHPP-000V(048), Section (57-20,57-1)RS & 56RS -3, McLean County, Contract No. 70767, and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

### DESCRIPTION OF PROJECT

The project consists of patching, milling, resurfacing, guardrail improvement and other miscellaneous items necessary to complete the work.

### INTENT OF PROJECT

The intent of this project is to resurface FAP Routes 730 & 322 (US 51 & US 51 BUS) from Woodrig Road in Bloomington to Country Acres Road to provide an improved roadway surface. The items on this project will be constructed while maintaining at least one lane of traffic.

This work must be accomplished in a manner causing the least amount of damage possible to the environment and giving the maximum possible protection to the public, while minimizing disruption and inconvenience.

### TRAFFIC CONTROL PLAN

Eff. 09-11-1990

Rev. 01-01-2014

Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction, the applicable guidelines contained in the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways, these Special Provisions and any special details and highway standards contained herein and in the plans.

Special attention is called to Articles 107.09 and 107.14 of the Standard Specifications, the following Highway Standards relating to Traffic Control, and the listed Supplemental Specifications and Recurring Special Provisions.

|                    |        |        |        |        |
|--------------------|--------|--------|--------|--------|
| Highway Standards: | 701101 | 701400 | 701406 | 701411 |
|                    | 701421 | 701426 | 701456 | 701701 |
|                    | 701901 |        |        |        |

## **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

SHEET DESCRIPTION

|         |  |
|---------|--|
| 1       | COVER SHEET  |
| 2       | INDEX OF SHEETS & LIST OF HIGHWAY STANDARDS                      |
| 3       | GENERAL NOTES  |
| 4 - 8   | SUMMARY OF QUANTITIES  |
| 9 - 16  | EXISTING & PROPOSED TYPICAL SECTIONS                             |
| 17 - 40 | SCHEDULE OF QUANTITIES   |
| 41 - 42 | CENTERLINE TIE POINTS  |
| 43 - 48 | PLAN SHEETS  |
| 49 - 54 | PAVEMENT MARKING DETAILS   |
| 55      | DETECTOR LOOP DETAILS  |
| 56      | PCC PARTIAL DEPTH HOT-MIX ASPHALT PATCHING DETAIL                |
| 57      | BUTT JOINT DETAILS   |
| 58      | RUNDOWN DETAILS UNDER S.N. 057-0047 & S.N. 057-0048              |
| 59      | DETAIL OF PRIVATE AND COMMERCIAL ENTRANCES                       |
| 60 - 61 | DETAIL OF SIDEROADS & SIDE STREETS                               |
| 62 - 65 | TRAFFIC BARRIER TERMINAL TYPE 6B (SPECIAL) DETAIL                |
| 66      | PAVEMENT MARKING AND MARKERS (RURAL & URBAN APPLICATIONS) DETAIL |
| 67      | PAVEMENT MARKING (INTERSTATE & MULTI-LANE APPLICATIONS) DETAIL   |
| 68      | SURVEY MARKERS TYPE 1 & 2 (SPECIAL) DETAIL                       |
| 69      | SURVEY MARKER VAULT (DETAIL)                                     |

## STANDARD

| STANDARD  | DESCRIPTION  |
|-----------|--|
| 000001-06 | STANDARD SYMBOLS ABBREVIATIONS AND PATTERNS                                    |
| 001006    | DECIMAL OF AN INCH AND OF A FOOT   |
| 442201-03 | CLASS C AND D PATCHES  |
| 462011-03 | HMA, SHLO, STRIPS/SHLDS, WITH RESURFACING OR WIDENING AND RESURFACING PROJECTS |
| 532001-10 | STEEL PLATE BEAM GUARDRAIL   |
| 530011-09 | GUARDRAIL MOUNTED ON EXISTING CULVERTS   |
| 630101-09 | SHOULDER WIDENING FOR TYPE 1 (SPECIAL) GUARDRAIL TERMINALS                     |
| 630301-06 | TRAFFIC BARRIER TERMINAL, TYPE 2   |
| 631011-09 | TRAFFIC BARRIER TERMINAL, TYPE 6B  |
| 631033-06 | TRAFFIC BARRIER TERMINAL, TYPE 6B  |
| 642006    | SHOULDER RUMBLE STRIPS, 8 INCH   |
| 667101-02 | PERMANENT SURVEY MARKERS   |
| 701101-06 | OFF-ROAD OPERATIONS, MULTILANE, 15' (4.5M) TO 24' (600MM) FROM PAVEMENT EDGE   |
| 701400-09 | APPROACH TO LANE CLOSURE, FREEWAY/EXPRESSWAY                                   |
| 701406-10 | LANE CLOSURE, FREEWAY/EXPRESSWAY, DAY OPERATIONS ONLY                          |
| 701411-09 | LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMP, FOR SPEEDS 2-45 MPH         |
| 701421-07 | LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS 2-45 MPH TO 55 MPH    |
| 701426-06 | LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS 2-45 MPH     |
| 701436-03 | PARTIAL EXIT RAMP CLOSURE FREEWAY/EXPRESSWAY                                   |
| 701701-10 | URBAN LANE CLOSURE, MULTILANE INTERSECTION                                     |
| 701801-05 | TRAFFIC CONTROL DEVICES  |
| 725001    | OBJECT AND TERMINAL MARKERS  |
| 780001-05 | TYPICAL PAVEMENT MARKINGS  |
| 781001-04 | TYPICAL APPLICATIONS RAISED REFLECTIVE PAVEMENT MARKERS                        |
| 782006    | GUARDRAIL AND BARRIER WALL, REFLECTOR MOUNTING DETAILS                         |
| 885001-01 | DETECTOR LOOP INSTALLATIONS  |

[illegible]

*Per Article 105.05,  
Highway Standards  
indicated by revision  
number listed in the  
Index of Highway  
Standards on the  
plans override the  
index numbers listed  
anywhere else.*



ELMSO11:DTGB2392:ELMRO92H  
05/20/16 22:42:48

ILLINOIS DEPARTMENT OF TRANSPORTATION  
ELM CONTRACT AWARD NOTICE (ORIGINAL)

LETTING DATE: 04/22/2016 LETTING TYPE: 1-SCHEDULED  
LETTING ITEM NBR: 046 CONTRACT NBR: 70767 DISTRICT: 05 RESP BUREAU: DESIGN  
CONTRACT SECTION: (57-20,57-1)RS&5GRS-3  
ESTIMATED NBR OF WORKING DAYS: 065  
WORK DESCRIPTION: This project consists of 2.92 miles of resurfacing with guardrail upgrades on  
US 51 and US Business 51 from Woodridge Road in Bloomington to Country Acres  
Road.

AWARD DATE 05/19/2016

CONTRACTOR 5183 - Rowe Construction, A division of  
United Contractors Midwest, Inc.  
1523 N. Cottage Street  
Bloomington IL 61701-0609

PROJECT IND: PROJECT NBR: NHPP-000V/048/  
PROJECT SECTION: (57-20,57-1)RS & 5GRS-3  
PPS NUMBER(S): 5-53909-0000  
CONTRACTOR PAYMENT NON-OBLIGATED FUNDS:

STATE JOB NBR: C-95-024-09  
ROUTE: FAP 730 FAP 322

IND CODE SPLIT PRIORITY FY APPROPRIATION CODE EXP IDOT BOB  
A 02A 00 01 16 695-49442-7700-0115 7721 2015-0017 06-1153 3,043,222.80 100.000  
GRP PROG

COUNTY 113 - MCLEAN GROUP \*\*\*\*\* P A Y M E N T P A R T I C I P A T I O N \*\*\*\*\*  
FUND AREA SEQ CONST SFTY AWARD AMT IND PARTICIPANT AMOUNT % MAXIMUM AMOUNT

Z001 L 01 0005 722,001.07 A FEDERAL(IL) 577,600.86 80.0000  
STATE OF IL 144,400.21 20.0000

FUND/AREA/SEQ TOTALS 722,001.07

Z001 L 02 0005 2,321,221.73 A FEDERAL(IL) 1,856,977.38 80.0000  
STATE OF IL 464,244.35 20.0000

FUND/AREA/SEQ TOTALS 2,321,221.73

COUNTY TOTALS 3,043,222.80

PROJECT TOTALS 3,043,222.80

CONTRACT TOTALS 3,043,222.80

Awarded date 05/19/2016

STATE OF ILLINOIS  
CONTRACT

Execution Date

ITEM 046  
04/22/2016

1. THIS AGREEMENT, made and concluded this 31st day of May, 2016  
(for Department use only)

between the State of Illinois, acting by and through the Department of Transportation, known as the party of the first, and

Rowe Construction, A Division of United Contractors Midwest, Inc.

his/their executors, administrators, successors or assigns, known as the party of the second part.

2. WITNESSETH: That for and in consideration of the payments mentioned in the Proposal hereto attached, to be made and performed by the party of the first part, and according to the terms expressed in the Bond referring to these presents, the party of the second part agrees with said party of the first part at his/their own proper cost and expense to do all the work, furnish all materials and all labor necessary to complete the work in accordance with the plans and specifications hereinafter described, and in full compliance with all of the terms of this agreement and the requirements of the Engineer under it.

THE STATE OF ILLINOIS  
By the Department of Transportation

By Randal S. Blankenhorn  
Part Blankenhorn  
Secretary  
Michael Layden  
Chief Contracts Official  
Date 5/13/16

Seal of the State of Illinois

Rowe Construction, A Division of United Contractors Midwest, Inc.

Robert A. Blum 5-25-2016  
Signature/Date  
Albert W. Blum Blum  
Printed Name and Title  
Attest by Signature/Date  
GREGG L. SHORE Shore  
Printed Name and Title  
Corporate Name  
Signature/Date  
Printed Name and Title  
Attest by Signature/Date  
Printed Name and Title  
Corporate Name  
Signature/Date  
Printed Name and Title  
Attest by Signature/Date  
Printed Name and Title  
(if an individual)  
d/b/a Party of the Second Part

Callen Caplan  
Chief Procurement Officer/State Purchasing Officer  
Date 5/13/16

Execution Date:

Cannot start before execution date Per Article 108.03; must start within 10 days after the date the contract was executed, unless otherwise provided in the contract or directed in writing by the Regional Engineer

STATE OF ILLINOIS  
CONTRACT BOND

ITEM 046

04/22/2016

KNOW ALL MEN BY THESE PRESENTS, That we Rowe Construction, A division of United Contractors Midwest, Inc.

a Corporation organized under the laws of the State of Illinois

and licensed to do business in the State of Illinois, as Principal, and Travelers Casualty and  
(Name of Surety)

Surety Company of America

and existing under the laws of the State of Connecticut, with authority to do business in the State of Illinois, as Surety, are held and firmly bound unto the People of the State of Illinois in the penal sum of

**THREE MILLION FORTY-THREE THOUSAND TWO HUNDRED TWENTY-TWO DOLLARS & 79/100 CENTS (\$3,043,222.79)**

lawful money of the United States, well and truly to be paid unto said People of the State of Illinois, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly, severally and firmly by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that whereas, the said Principal has entered into a written contract with the State of Illinois acting through the Department of Transportation, for the construction of the work designated as:

**Contract 70767**

**McLean County**

**Section (57-20,57-1)RS&56RS-3**

**Fed. Proj. No. ACNHPP-000V(048)**

**FAP 730,FAP 322**

**District 5**

which contract is hereby referred to and made a part thereof, as if written herein at length, in and whereby the said Principal has promised and agreed to perform said work in accordance with the terms of said contract,



**Illinois Department  
of Transportation**

County MCLEAN

Section (57-20,57-1)RS&S6RS-3

Progress Schedule Sheet 1 of 2

Route FAP 730, FAP 322

Date of Award 5/19/2016 Execution Date

Starting Date 6/6/2016

District 5

Contract No. 70767

Job No. C-95-024-09

Date of Estimated Completion 10/5/2016

Contractor Rowe Construction, a div of UCM, Inc. Address 1523 N Cottage Ave, Bloomington, IL 61701 Project ACNHPP-000V(048)

| Month - (Begin with starting month)<br>Projected Working Day Per Month | June 2016<br>14     | July 2016<br>17             | August 2016<br>17 | Sept 2016<br>16 | Oct 2016<br>1 | TOTAL<br>WD's                   |
|--|---------------------|-----------------------------|-------------------|-----------------|---------------|---------------------------------|
| Work Item  | Quantity<br>& Units | Daily<br>Production<br>Rate |                   |                 |               |                                 |
| Class D<br>Patch   | 2303<br>Sq Yd       | 230                         |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |
| Partial<br>Depth<br>Patch  | 312<br>Ton          | 52                          |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |
| Partial<br>Depth<br>Rem  | 1482<br>Sq Yd       | 247                         |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |
| HMA Rec<br>Milling   | 50,467<br>Sq Yd     | 3,882                       |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |
| Seal Coat  | 49<br>Ton           | 49                          |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |
| HMA Binder<br>Surface  | 14,604<br>Ton       | 811                         |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |
| HMA<br>Shoulders   | 4110<br>Ton         | 685                         |                   |                 |               | Proposed<br>DBE/WBE<br>Trainees |

cc - Contractor  
Engineer of Construction  
Regional Engineer  
Resident



Contractor  
District Construction Engineer  
Date  
Date



## SECTION 109. MEASUREMENT AND PAYMENT

### 109.01 MEASUREMENT OF QUANTITIES

#### 109.01-1 Documentation

##### 109.01-1(a) Department Documents

The IDOT [Documentation of Contract Quantities](#) publication provides detailed information on calculating quantities for payment. All Department field staff must have an in-depth knowledge of this publication. The following also apply to documentation:

- Construction Memorandum No. 33, Operational Review of Contract Quantities, in Appendix A, discusses procedures for District reviews of project support documentation for contract quantities.
- Construction Memorandum No. 81, District Construction Project File Requirements, in Appendix A, presents requirements for the retention of District construction files (e.g., retainage).

##### 109.01-1(b) General

Contract work, as bid by the Contractor, is measured and paid as contract pay items. The contract documents will specify the following information for each item:

- The unit of measure
- The method of measurement
- The estimated quantity
- The system for the unit of measure (i.e., US Customary or metric (SI))

Each contract item represents a unique construction element of the project (e.g., guardrail, pipe culvert, riprap). Contract items may be measured by units of each, length, area, volume, weight or lump sum. The contract documents also include the estimated quantity of each contract item. The actual quantities of the various contract items performed by the Contractor must be determined by measurement and calculation, unless [Form BC 981: Agreement on Accuracy of Plan Quantities](#), is signed.

Differences often exist between the estimated quantities shown in the contract documents and the actual quantities that result during construction. If necessary, contact the designer to discuss the project quantities (e.g., how were the quantities calculated?). If necessary, request additional backup quantity information, such as earthwork calculations, to assist in determining the planned quantity for a specific item for payment, or if there is a suspected conflict or discrepancy with the field-calculated earthwork based on the project staking notes.

**109.01-2      Accuracy of Measurement**

All pay item quantity documentation is subject to audit and review and, therefore, must be complete, accurate and established in a manner that is clear, concise and easily followed and understood by personnel unfamiliar with the project.

All contract quantities must have written data to support payment. The source document should include all pertinent information on the location, method of measurement (e.g., tons, cubic yards, square yards, lump sum, pounds, each), dates of installation, etc.

Measure and calculate contract item quantities to a degree of accuracy according to Section B of the IDOT Documentation of Contract Quantities.

**109.01-3      Weight Checks**

This Section presents the Department's policy for the performance of independent weight checks for pay items where the method of measurement for payment is based on weight.

The IDOT Documentation of Contract Quantities outlines three types of weight checks that must be performed by State (or local agency) representatives. They include one for weekly independent weight checks, and two types (that should be alternated) for ticket weights determined from batch weights.

The weekly independent weight check will be documented on [Form BIC 2367](#). A copy of Form BIC 2367 (performed by Department personnel) will be forwarded to the Central Bureau of Construction and the Bureau of Investigations and Compliance.

The two weight checks for batch plants may be reported on 1) the Bituminous Daily Plant Output Report, Form MI-305, or 2) the Independent Weight Check, Form BIC 2367, or 3) other methods using the format described in the IDOT Documentation of Contract Quantities. Results shall be placed in the job file. Do not forward copies to the Central Bureau of Construction nor to the Bureau of Investigations and Compliance.

**109.01-4      QC Checks By Contractor**

The IDOT Documentation of Contract Quantities outlines the scale checks that must be performed by Contractors as part of the QC process. The scale checks will be documented on Form BIC 2367 and/or the Bituminous Daily Plant Output Report. Copies of QC checks by the Contractor should not be forwarded to the Central Bureau of Construction nor to the Bureau of Investigations and Compliance.

**109.01-5      Weighing**

See the IDOT Documentation of Contract Quantities. If loads or portions of loads are rejected, notes explaining the reason should be made on the respective load ticket or invoice, initialed and dated by the authorized Department Inspector.

At the discretion of the Department, in lieu of paper delivery tickets, the Contractor may employ the use of an automated electronic ticket (i.e. "e-ticket") system. If the District desires to approve

the Contractor's request, the District should coordinate Department approval with the Central Bureau of Construction. At a minimum, the automated e-ticketing system shall provide electronic, real-time tickets meeting the same criteria as per Article 109.01 of the Standard Specifications for Road and Bridge Construction, 3rd paragraph. Approved electronic tickets shall be considered to meet the Standard Specifications for Road and Bridge Construction in reference to "automatic printer", "delivery ticket", or any other reference to printed tickets.

It is anticipated an e-ticket system should satisfy the following:

1. E-tickets must contain all ticket data required by specification
2. The Department needs the ability to receive an e-ticket via e-mail (on a ticket by ticket basis) after an e-ticket is accepted. (This serves as a check against ticket data stored on a vendor website.)
3. The Department needs the ability to add comments to an e-ticket (e.g. test results, when only partial tonnage from a load is used, inspector initials, etc.)
4. The Department needs the ability for a RE/Inspector to safely identify which load they are accepting. (E.g. truck numbers should be readily displayed on side of trucks. In addition, the truck number and load number should readily be displayed on an e-ticket.)
5. The Department needs the ability to accept or reject an e-ticket
6. The Department needs the ability to undue an "accept" or "reject" action
7. Online e-ticket reporting functionality should be exportable. (E.g. the Department needs the ability to summarize e-tickets for a specific date or range of dates and export data to excel.)

#### **109.04 PAYMENT FOR EXTRA WORK**

##### **109.04-1 General**

The Department reserves the right to require the performance of extra work to satisfactorily complete the contract work. It is in the best interest of both the Department and the Contractor to anticipate extra work whenever possible. Options for completing any extra work should be discussed with both the Contractor and Construction Field Engineer/Area Supervisor. A Contractor shall not begin this work without written authorization from the Department. Refer to Article 104.02 and Construction Memorandum No. 4 in Appendix A for extra work payment.

##### **109.04-2 Method of Payment Definitions**

The basic method of payment to the Contractor for extra work will be one of the following:

1. Contract Unit Prices. This method uses existing items and unit prices in the bidding schedule.

2. Agreed Unit Price (AUP)/Lump-Sum Price. AUP establishes new items and unit prices to pay for extra work. In general, an agreed unit price approach is used when there is a key component (e.g., cubic yards of structural concrete) of the overall construction element that can be used to provide payment for the Contractor's work. The AUP approach is best suited when the work can be quantified in advance.

Lump sum is used for payment for extra work when it is appropriate to pay for the completed work as a unit; i.e., the lump-sum price is the total agreed cost for all work associated with the construction of an overall construction element. It includes the cost of all materials, labor and equipment. This method is appropriate when it can be determined that there will be no changes or adjustments to the original scope or quantity of extra work agreed upon.

3. Force Account. A force account compensates the Contractor for extra work based on the actual hours worked and the equipment and materials used (i.e., time and materials). It is more cumbersome and administratively complex than either an agreed unit price or lump-sum price payment. Force account is best used when:
  - Defining the work clearly and accurately enough for a change order with an agreed unit or lump-sum price is too difficult
  - The extra work needs to begin immediately
  - The Department and the Contractor cannot agree on an agreed unit or lump-sum price for the extra work

#### **109.04-3     Lump Sum or Agreed Unit Price**

Either the Resident or the District Office will receive a letter from the Contractor proposing payment for extra work at a lump sum price or an agreed unit price. This request is forwarded to the District estimator who either approves or rejects the price. If the lump sum or agreed price is approved, the Contractor shall be given written confirmation of the approved method of payment and permission to proceed with the work. If the request is denied, one or two options exist — either the Contractor may resubmit the proposal with changes, or the Department will direct the Contractor to proceed under a force account basis.

#### **109.04-4     Force Account**

If it becomes necessary to do extra work under a force account basis, the Contractor shall perform the work in the most expedient and economical manner possible. This shall be discussed before the work actually begins. In this discussion, the labor force required, equipment to be used, and any material needed will be determined. After these issues are resolved, the extra work may proceed.

On a force account, the Resident should agree with how the work will be performed and the labor, materials and equipment that the Contractor will use before the work is performed. The Resident can also decide what to include and exclude on a force account.

Each day that the Contractor proceeds working on the extra work, an Extra Work Daily Report, [Form BC 635: Extra Work Daily Report](#), shall be completed. Form BC 635 shall then be signed by both the Contractor's and Department's representatives. The original shall be given to the Contractor for future billing and a copy retained in the job file. Upon receiving the force account billing from the Contractor, the Resident shall check it for accuracy with the Extra Work Daily Report, Form BC 635, in the job file. The Contractor billing should resemble that shown in the IDOT Documentation of Contract Quantities. Once checked, processing for payment may proceed.

When extra work is performed by an Engineering firm hired by the Contractor, the cost should be administered as work performed by an approved Subcontractor per article 109.04(b)(7).

It is recommended that an authorization for an estimated amount is processed before the work begins.

Refer to Construction Memorandum No. 9 in Appendix A for procedures to process a force account bill.

### **109.05 EXPENSES INCURRED BY THE DEPARTMENT**

The following are examples of items that typically apply to Article 109.05:

1. Utility work such as residential service hookup (beyond the meter) and utility service drops
2. Railroad flagger bills in accordance with Article 107.12
3. Utility charges that are the responsibilities of the Department.

To calculate the administrative cost, the following example is provided to ensure consistent interpretation of the specification. If the Contractor received three railroad flagger invoices for \$5000 each and issued one payment of \$15,000 for the three invoices, the administrative cost is  $(0.05 \times 10,000) + (0.01 \times 5,000) = \$550$ . If the Contractor received three railroad flagger invoices for \$5000 each and issued three payments (one payment for each invoice), the administrative cost would be  $(0.05 \times 5,000) + (0.05 \times 5,000) + (0.05 \times 5,000) = \$750$ .

### **109.07 PARTIAL PAYMENTS**

One of the most important duties of the Resident is to submit pay estimates for quantities of completed work. The contract between the State and the Contractor differentiates two types of payments to the Contractor – partial payments (Article 109.07) and final payments (Article 109.08). The Resident's work on a project is not complete until the final payment has been made to the Contractor.

#### **109.07-1 Progress Payments**

##### **109.07-1(a) Frequency of Progress Pay Estimates**

Due to the large dollar value and duration of many contracts, Article 109.07 of the *Standard Specifications for Road and Bridge Construction* provides for partial payment to the Contractor

for work completed to date. A partial payment, commonly referred to as a progress payment, is initiated by the Resident when he/she completes and submits a pay estimate. Article 109.07 specifies that a partial payment will be made to the Contractor at least once per month. However, if the State is the awarding authority, payment will be made only if the value of the payment is \$1,000 or greater.

Depending on the size of the contract, progress pay estimates may be submitted on a more frequent basis. Normally, pay estimates are not submitted more often than twice a month. However, on a multimillion-dollar project, progress pay estimates may be submitted weekly if sufficient work has been completed to justify that schedule. The Resident may wish to discuss the payment schedule with the prime Contractor to ensure that all involved know when payments can be expected.

Each pay estimate must be processed individually by the Central Bureau of Construction. Due to the time required to process each payment, pay estimates should not be submitted more frequently than once per week. Two or more estimates should never be submitted at the same time.

#### **109.07-1(b) Submittal of Progress Pay Estimates**

Pay estimate entries may be made using CMMS, ICORS, or on preprinted forms. If CMMS or ICORS is used, pay estimates should be emailed with a statement indicating the Resident's approval for the contract and pay estimate number (i.e., "I hereby approve this estimate for payment.").

On State let State Contracts CMMS or ICORS must be used. Pay estimates must be emailed, by the Resident, to [DOT.PayEST@illinois.gov](mailto:DOT.PayEST@illinois.gov). Copies of the pay estimate should be sent to the prime Contractor.

On State let local agency contracts, if using CMMS or ICORS, and after the local agency employee in responsible charge of the contract includes a statement indicating their approval of the estimate (i.e., "I hereby approve this estimate for payment."), pay estimates should be emailed to the District contact. After the estimate is approved in the District, the pay estimate, along with a statement indicating the District's approval (i.e., "I hereby approve this estimate for payment."), should be emailed to [DOT.PayEST@illinois.gov](mailto:DOT.PayEST@illinois.gov) and the Contractor.

On State let local agency contracts, if not using CMMS or ICORS, three copies should be mailed to the District contact for approval and one copy retained in the project file. Two sets of signature approvals are required — one from the local agency employee in responsible charge of the contract, and the other from an IDOT employee overseeing the local agency's contract (i.e. the District contact).

#### **109.07-1(c) Quantities to Submit on a Progress Pay Estimate**

On progress pay estimates, the payment quantities for most pay items may be estimated. Estimates can be made for either the quantity of completed work (e.g., volume of earth excavation completed) or the percentage of work completed. The basis for all estimates should be clearly stated in the Resident's documentation. Quantities paid must be assigned to the correct fund

code and County, Construction, Safety (CCS) Code, because these must be correct by the end of the project. These codes may appear to be random but are not. They are utilized to ensure that proper funding is charged for the project from State, Federal and local sources.

The Project Procedures Guide provides information for what is acceptable evidence of material inspection. This is a critical item and the Resident must have the evidence in their files, if the evidence is a document (i.e., tickets or an inspection report).

The pay estimate will include the quantities for all pay item work completed in accordance with the contract. It is in the best interest of the State that the Contractor is paid promptly for all work properly performed. All quantities, which are submitted on a pay estimate, must be supported by acceptable documentation. See Section 109.07-1(e).

All work accepted for progress payment must be maintained in acceptable condition until final payment. For example, new drainage structures must be clean at the time of final inspection. The cost of maintaining newly installed structures is included in the cost of the drainage structures. Ordinarily, it is not necessary to withhold a percentage of the payment for the item for such contingencies. Withholding must be discussed with the Resident's Construction Field Engineer/Area Supervisor.

The Resident must use discretion when deciding how to pay for work that is partially completed. The Resident must never pay the full price for partially completed pay item quantities. The following general principles apply:

1. The value of the partially completed work. The norm is to pay the Contractor for completed units of pay item work. However, if the Contractor is bearing a large cost for partially completed work, typically for lump sum or each item, it may be in the interest of the State to pay a calculated percentage of the pay item cost. Examples of incomplete work include intermediate lifts on bituminous pavement and traffic control (for which the Department has set up a partial payment schedule).
2. Risk to the State if the work is not eventually completed by the Contractor or if the work is not completed in a timely manner. This may happen, for example, if the Contractor goes out of business before the work is completed. Control of payment for partially completed work is one of the Resident's most effective tools for encouraging the Contractor to comply with the terms of the contract.
3. Risk of damage to partially completed work. For example, the Department does not ordinarily pay for traffic signal control cabinets installed but not yet tested.

#### **109.07-1(d) Effect of Change Authorizations on Pay Estimates**

When additional work has been added to a contract, whether it is due to a routine change in contract quantities or an addition of new work to the contract, the Contractor needs to be paid for the completed work in a timely manner. To accomplish this, a change authorization adding the work should be submitted as soon as a contract addition is known. If the work will be done on a force account basis, an authorization using the estimated costs should be submitted as early as possible, with a revised authorization submitted when final costs are known. There are a number

of pay items that have been set up for specific items on change authorizations. A list of these items is included in Construction Memorandum No. 4, Contract Changes – Articles 104.02 and 109.04.

Balancing authorizations should be submitted as work under various pay items are completed, rather than waiting until the end of the project to submit a single balancing authorization for all of the pay items.

#### **109.07-1(e) Items NOT to Submit on a Progress Pay Estimate**

1. Never pay for work for which you do not have adequate evidence of material inspection. Section 106, Control of Materials, of the *Standard Specifications* discusses approval of materials incorporated into the work.
2. Never pay for work that has not been performed. For example, at the end of the fiscal year in June, payments may be temporarily delayed while the Comptroller performs their end-of-year accounting and establishes the appropriations for the upcoming fiscal year. On the last pay estimate of the fiscal year, it is illegal to pay for quantities of work that the Contractor intends to perform in the immediate future.
3. Never “swap” pay items. It is illegal to pay for work covered by one pay item by submitting it on the pay estimate as a different pay item, no matter how similar in description or price the pay items are. If a new type of work is required, then a new pay item (agreed unit price or force account) must be added to the contract by a change authorization.
4. Never bury non-pay item costs in the contract. For example, if an engineering mistake is made in laying out an item, causing the Contractor to have to perform the work twice, the extra cost should be submitted on an authorization as extra cost due to an engineering error. It is not acceptable to pay for the work twice under the pay item.
5. Never pay for work that is not complete in accordance with the contract specifications. If it is decided that non-compliant work may remain in place, a credit for non-compliant work/material may be pursued.
6. Never pay for work for which you do not have adequate documentation to support the quantity paid. For example, if the Contractor refuses to cooperate in weighing a tonnage item on an approved scale (when required by the contract), then do not pay for the unsupported quantity unless directed to do so by your Construction Field Engineer/Area Supervisor.

Paying for work in other than the approved manner may constitute a felony. Residents should be careful to follow the policies and procedures enumerated in the above related to payments.

#### **109.07-1(f) Corrections to Pay Estimates**

If errors are discovered in the project quantity documentation, the errors must be corrected as soon as possible. The quantity must also be updated as soon as possible so that the correction



can be reflected no later than the next pay estimate. This is especially important if the error being corrected resulted in a large overpayment to the Contractor.

If an error is discovered in the preparation of a pay estimate after submitting the estimate, under most circumstances, if the error is discovered immediately, the correction can be made over the telephone. In this case, the Resident should contact the District Construction Office which, in turn, will contact the Central Bureau of Construction to make the correction. Any corrections made by telephone should be documented in the project diary, and the quantity book must be updated to reflect the correction on the next pay estimate.

#### **109.07-2     Material Allowances**

Article 109.07 permits the Department, at its discretion, to pay the Contractor for costs incurred in supplying non-perishable materials under certain conditions.

The intent of this provision is to pay the Contractor for costs incurred for a particular contract for payment that would not normally be made until the materials are incorporated into the project. It is not the intent of this provision to pay material allowances for stocks of materials that can easily be acquired by the Contractor to meet project scheduling.

A material allowance is different from a payment for partially completed work. In the case of a partially completed pay item, material is consumed as work progresses and the Contractor is paid based on work accomplished. For material allowances, none of the covered material is yet incorporated into the project pay items.

The following conditions must be met to qualify for a material allowance:

1. The Contractor must submit acceptable evidence of passing material inspection(s).
2. The material must be non-perishable and is intended for use only on a specific contract.
3. The material should normally be ready to incorporate into the work. For example, structural steel must be fabricated. Form BBS 59 shall be used as documentation to substantiate the material allowance for fabricated structural steel.
4. All material for which an allowance is to be paid must be in secure storage on the project or at a location acceptable and accessible at any time by the Department. The material must be properly protected from damage. If the material becomes damaged or otherwise unacceptable, it shall be removed from the material allowance. If stored off the project site, the location must be such that the Resident can maintain reasonable control, either directly or through District staff. The State must be able to "take possession" of the material if the Contractor should default on the contract. For this reason, certain materials such as borrow cannot be considered for an allowance due to the problems the Department would encounter in taking title under this situation.
5. The Contractor must present proof of payment within 60 days after receiving payment from the Department or the material allowance will be reclaimed. Proof of payment could include:

- Copies of canceled checks (front and back)
  - Copies of checks with some form of verification from the financial institution
  - A copy of an invoice from the Supplier marked "Paid by check number \_\_\_\_\_," which also includes the date, signature and title of the supplier's representative
  - Other acceptable documentation
6. There must be a clear benefit to the Department and the Contractor for purchasing the material in advance. For example:
- There is a perceived or potential national or regional shortage of the material.
  - The time required to prepare the material is critical to meeting the contract schedule.
  - The cost of the material is expected to rise before the material is to be incorporated into the work.
7. Materials that can be readily supplied to the contract and materials that are expected to be incorporated within 60 calendar days should not be included in material allowances.
8. The inclusion of a material on a material allowance should not place an undue burden on the District with extra inspections or other monitoring requirements.
9. Because other costs are included with the material cost in the unit price of a pay item, the dollar value of the material allowance should represent only the bare material cost- and cost-plus transportation shall not exceed 70% of the cost of the corresponding pay item(s). Paying for more than 70% of the pay item cost can be considered in special situations but under no circumstances shall the value of the material allowance equal the value of the corresponding pay item work.
10. No allowance will be made for fuels, form lumber, falsework, temporary structures or other work that will not become an integral part of the finished construction.
11. As the materials are incorporated into the project and paid as a normal pay item, the value of the material allowance(s) will be reduced on the same pay estimate.
12. The following items are typically acceptable for material allowance payment:
- Fabricated structural steel
  - Complete bridge bearing assemblies
  - Precast structural units (e.g., beams, deck planks)
  - Fabricated sign trusses
  - Mast arms

- Items impacted by a regional or statewide shortage
- Groups of items common except for type or size (e.g., pipe for culverts or storm sewers)

13. All material allowances must be submitted by the prime Contractor. Direct submittals from subcontractors or material suppliers will not be allowed.

To maintain uniformity in the payment of material allowances, the Bureau of Construction is always available for consultation on special situations involving material allowances. This is strongly encouraged for such issues as perceived material shortages and for non-typical material allowances.

## **109.08 ACCEPTANCE AND FINAL PAYMENT**

### **109.08-1 Final Payment**

The final payment is based on those completed pay item quantities included in the original contract documents and those quantities that have been added by an approved change order. A representative of the State or local agency must be present for all measurements taken for final payments. Payments shall not be based on Contractor measurements.

Final payment is normally made to the Contractor only after the following conditions have been met:

1. All physical work has been satisfactorily completed and accepted.
2. All documentation requirements have been satisfactorily completed.
3. All materials incorporated into the work have been certified.
4. The Contractor has agreed to final quantities.
5. DBE payment agreement forms have been submitted to document compliance with DBE goals (if required).
6. All appropriate EEO forms and payrolls have been filed.

### **109.08-2 Contract Closeouts**

Contract closeouts are an important part of the overall contract administration process. Until a project is closed and the Contractor receives the final payment, the project is not complete. The following closeout process has been developed as a guide to facilitate the timely closeout of projects. Recognizing that projects differ in complexity and size, the time frames given may need to be adjusted in certain situations.

The positions listed are suggestions of who may perform the duties. The actual individual or position completing a process will vary depending on the District, available personnel, if a local agency is involved and other factors. All projects should be closed within six months of the final

inspection. However, there will occasionally be projects with performance requirements, liens, warranties, claims or other special circumstances that may require additional time.

**I. WEEKLY REPORT OF RESIDENT (Form BC 239) submittal, Final Inspection and Punch List (Article 105.13) time frames.**

- A. The Resident submits Form BC 239 at 99.5% a maximum of 3 days from the date all physical work was complete.
- B. The Resident performs inspection a maximum of 2 days after the physical work complete date to determine initial punch list.
  - 1. No initial punch list by the Resident.
    - a. The Resident contacts the Construction Field Engineer/Area Supervisor to perform final inspection. The Construction Field Engineer/Area Supervisor conducts the final inspection, including other Bureaus and local agencies as necessary, within ten days and, if all work is completed, the Resident submits Form BC 239 at 100% within three days.
    - b. If a punch list is developed, the Resident submits Form BC 239 at 99.9% within 3 days. The Contractor is allowed 5-7 days to re-mobilize to perform punch list items before Resident begins to charge working days. When punch list items have been completed to the satisfaction of the Resident and Construction Field Engineer/Area Supervisor, the Resident submits Form BC 239 at 100% within three days.
  - 2. Initial punch list issued by Resident.
    - a. Resident issues initial punch list to Contractor and submits Form BC 239 at 99.9% within 3 days. The Contractor is allowed 5-7 days to re-mobilize to perform punch list items before Resident begins to charge working days. If possible, this initial punch list is given to the Contractor prior to their demobilization. When initial punch list items have been completed to the satisfaction of Resident, the Resident contacts Construction Field Engineer/Area Supervisor to conduct the final inspection. The Construction Field Engineer/Area Supervisor conducts the final inspection including other Bureaus and local agencies as necessary and, if all work is completed, the Resident submits Form BC 239 at 100% within three days.
    - b. If a subsequent punch list is issued to the Contractor, the Contractor is allowed 5-7 days to re-mobilize to perform punch list items before Resident begins to charge working days. When punch list items have been completed to the satisfaction of Resident and Construction Field Engineer/Area Supervisor, the Resident submits Form BC 239 at 100% within three days.
- C. Once the 100% weekly report is received, Support checks database for any outstanding items that need to be addressed (e.g., extension of time, liquidated damages, Operations approval, coring waiver) and notifies appropriate personnel to resolve as soon as possible.

- D. Support personnel generate the “Final Inspection Letter(s)” for signature and distribution and begins preparation of office and Equal Employment Opportunity (EEO) files and plan retention. Support personnel begin to manage and assemble all final documents for final paperwork submittal to Central Bureau of Construction. Another option is the Resident or Construction Field Engineer/Area Supervisor generates the “Final Inspection Letter(s)” for signature, distribution and cc’s to Support.
- E. If the above guidelines are not met, non-compliance notifications may be sent by Support to the appropriate personnel, and the Construction Engineer is copied. The Construction Engineer will intervene if warranted. All time frames can be extended to allow for mitigating circumstances.

## **II. CONTRACT RECORDS AND AUTHORIZATION SUBMITTALS AND TIME FRAMES AFTER 100% COMPLETION DATE FROM FORM BC 239 IS KNOWN.**

- A. The Support Office must receive the contract records (job boxes) within 30 days after the 100% completion date for documentation and material certification reviews to commence. The Resident is required to contact the Support Office with an explanation if the 30-day time frame will not be met.
- B. The Resident submits to the Construction Field Engineer/Area Supervisor a balancing authorization of all remaining outstanding contract pay items, except outstanding force account work (see II.C.), within 30 days after 100% completion date and notifies Support of any outstanding authorizations. At this point, the Resident and Contractor have tentatively agreed to “final” quantities. If there are no outstanding extra work invoices (see II.C.), this authorization will be marked by Resident as “Final.”
  - 1. The Construction Field Engineer/Area Supervisor checks the authorization for errors and omissions. All District signatures are obtained per Construction Memorandum No. 4 in Appendix A. Support will again check for errors, omissions and BCM screen 64 for 4 (four) signature status. Support will then input authorization data into the District Project Implementation Support database for tracking purposes and to facilitate in the creation of the Net Cost of Section. The processing is completed, and the authorization is mailed to CBC. The target time for this process is 2 days.
  - 2. Support monitors Report to Web daily for authorization posting by CBC and notifies and processes.
  - 3. The Resident will contact Support personnel if the contract will have no authorizations.
- C. The Resident must receive all extra work invoices from the Contractor within 60 days after completion of the work (Article 109.04) for the Contractor to be paid for any extra work. This also includes items paid for by Article 109.05. The Resident will only accept corrected invoices after the 60-day parameter has lapsed. Resident submits the marked “Final” authorization to Construction Field Engineer/Area Supervisor 80 days after 100% completion date.

- D. If the above guidelines are not met, non-compliance notifications may be sent by Support to the Resident, and the Construction Engineer is copied. The Construction Engineer will intervene if warranted. All time frames can be extended to allow for mitigating circumstances.
- E. Once the acceptable contract files are submitted to the District office, the contract becomes the responsibility of the District. Implementation Support staff in direct charge of closing out the contract may create and sign the final “balancing” pay estimate that does not involve significant contract administration issues when the Resident is not available to do so. Construction Field Engineer/Area Supervisor or higher-line authorities may also create and sign the final pay estimate, or any future pay estimates that may involve significant contract administration issues as needed when re-opening the contract when the Resident is not available to do so.

### **III. FINAL QUANTITY SUBMITTAL AND TIME FRAMES AFTER “FINAL” AUTHORIZATION HAS BEEN POSTED BY CBC.**

- A. Support personnel download the Final Quantity Approval Sheets from mainframe TSOA program. These are mailed certified to the Contractor for its signature of approval with a cover letter stating the need for the following submittals. The Final Quantity Approval Sheets must be checked against the hard copy of the Final Pay Estimate by Support and, if any payments have not been made by the Resident, they are verified and added to the Final Pay Estimate for submittal with final paperwork. As an alternative, a Final Pay Estimate from BCM may be used if the Contractor’s signature and date are still collected.

It is not necessary to wait until Support has completed its review of final quantities to send the Contractor the final quantities. If the review finds quantity adjustments need to be made, the Resident will generate an authorization to correct the quantity, and Support sends the Contractor a Final Quantity Adjustment Letter or Revised Quantity Approval Sheets.

1. The Contractor has 21 calendar days from receipt of certified mail to either agree to final quantities or respond in writing indicating the quantities that are in disagreement. Failure to do so will be considered acceptance of the final quantities.
2. Performance requirements, [Form SBE 2115: DBE Payment Agreement](#), for each DBE Subcontractor (if applicable) and a [Form BC 2115: Subcontractor Payment Agreement](#), for non-DBE Subcontractors (if applicable). Time frames for submittal to Support depend on the Contractor and Subcontractor. Another option is for Support to send this request for submittal to the Contractor with the “Final Inspection Letter” (see I.D.).
  - a. Performance Requirements – Closeout cannot occur until warranty inspections are performed as directed in the *Standard Specifications*. This can delay closeout by several months.

- b. Form SBE 2115 and Form BC 2115 – Submitted within one month after Final Quantity Approval Sheets have been agreed to and submitted; this may require intervention by the District EEO Liaison.
- B. The Form SBE 2115 is attached to the DBE/WBE Final Documentation Form ([Form SBE 2028](#)) and submitted to the Bureau of Small Business Enterprises (SBE) in the Office of Business and Workforce Diversity. SBE will respond to the District, and this entire information becomes part of the final documentation submitted to CBC.
- C. Copies of the Final Quantity Approval Sheets are retained with the other Support final documents and given to Support Documentation and Support Material Certification personnel for the review process.
- D. Support will supervise and control the status of all document submittals on a daily basis. Once final quantities are agreed to, Support orders from BCM screen 41 a hard copy of “RE Pay Estimate Report,” to prepare for submittal to CBC with other final paperwork upon District closeout date.
- E. If the above guidelines are not met, non-compliance notifications may be sent to the Contractor by Support, and the Construction Engineer is copied. The Construction Engineer will intervene if warranted. All time frames can be extended to allow for mitigating circumstances.

#### IV. SUPPORT DOCUMENTATION REVIEW AND TIME FRAMES

- A. A contract records check-in sheet is completed by the Resident and submitted with the contract records. The check-in sheet is a fairly comprehensive visual aid for the documentation personnel to quickly locate certain items. It also aids the Resident to ensure that all documents are present.
  - 1. When records are submitted, the documentation reviewer checks the EEO monthly and payroll weekly log-in sheets for compliance. This check may also be completed by the District EEO Liaison or the Resident. If any required submittals are not logged-in, notification letters are generated, signed and sent to the Contractor. The District EEO Liaison and non-compliant Sub(s) are cc'd on the letter. A more comprehensive review of these items will occur when the actual documentation review process begins.
- B. The documentation reviewer starts the review process within 3 weeks after contract records are submitted. The documentation reviewer must have Final Quantity Approval Sheets to check accuracy of Quantity Book pay item quantities (see III.B.).
  - 1. Target times for initial review completion is 1 day to 3 weeks depending on the number of pay items, the dollar amount of the contract and the volume of documents.
  - 2. [Form BC 111: Checklist for Engineer's Final Payment Estimate](#) is started. Items 1-6, 10, 11, 19, 24, 26-28 are completed by the documentation reviewer with the Resident supporting if necessary. Form BC 111 is retained in a file on the S drive so that it can

be accessed and completed by other Support personnel as the conclusion of closeout nears.

C. Documentation personnel complete the review process and Resident is notified.

1. Resident has 10 days to complete all contract documentation deficiencies.

D. Documentation reviewer checks to ensure that all deficiencies have been corrected.

1. If corrections are not complete, Resident has 2 days to complete.

2. Documentation reviewer completes review within 2 days, distributes and retains findings.

E. If the above guidelines are not met, non-compliance notifications may be sent by Support to the Contractor or Resident, and the Construction Engineer is copied. The Construction Engineer will intervene if warranted. All time frames can be extended to allow for mitigating circumstances.

## V. SUPPORT MATERIAL CERTIFICATION REVIEW AND TIME FRAMES

This process time can be significantly decreased and, therefore, contract closeout time decreased, if the Resident strictly adheres to the discussion in Section 109.07-1(e), which presents items that must never be submitted on a progress pay estimate.

A. Material certifications should be in compliance when contract records are submitted. Resident will have submitted contract records (job boxes) within 30 days of the 100% [Form BC 239: Weekly Report of Resident](#) submittal.

B. Materials certification reviewer starts process within 1 month after Final Quantity Approval Sheets are received (see III.B.).

C. Material certification reviewer completes review within 2 weeks and generates a "Shortage Letter" that is sent to Resident and copied to Contractor.

D. Resident and material certification personnel work with Contractor, Subcontractors, suppliers and producers to resolve outstanding material certification issues. Material certification personnel work with other Districts to generate out-of-District material assignments and with District materials personnel for approvals. Target time frame for resolution is 1 month.

E. Material certification reviewer conducts a final review and completes process within 1 week.

F. An alternative option is, when the contract is 85% complete, a preliminary list of material certification deficiencies is compiled and sent to the Resident and Contractor. This provides all entities with another opportunity to reconcile deficiencies before contract records are submitted for review. The process will then follow A. through E.



- G. If the above guidelines are not met, non-compliance notifications may be sent by Support to the Contractor or Resident, and the Construction Engineer is copied. The Construction Engineer will intervene if warranted. All time frames can be extended to allow for mitigating circumstances.

## **VI. SUPPORT PREPARES FINAL DOCUMENTS FOR SUBMITTAL TO CBC AND CONTRACT CLOSE-OUT IS COMPLETE**

Support personnel obtain all documents necessary for closeout by the time the material certification review has been completed. Once the material certification review is complete, the close-out and final documents submittal to CBC occurs within 1 day.

## **VII. DATABASE**

Support personnel should manage and track all documents necessary through a database that was created in part considering monitoring requirements. The database should also generate various status sheets, reports, letters, etc., that aid in the administration and monitoring of all phases of the closeout processes for all District contracts.

## **VIII. CONTRACTOR**

The Contractor is also responsible for ensuring that projects are closed in a timely manner as described above. This includes the timely submission of all required documentation. The Resident should never pay for work for which there is not adequate documentation to support the quantity paid. Partial payment is discussed in Section 109.07. Failure to timely submit the required documentation, including that necessary to close a project, may result in a finding of non-responsibility on the part of the Contractor, resulting in the revocation of its prequalification.

## **109.09 CONTRACT CLAIMS**

### **109.09-1 Claims Avoidance**

#### **109.09-1(a) General**

The best mechanism for avoiding claims is to take an open and professional approach to claims avoidance by equitable adjustments for changes. Emphasizing field staff responsibilities for identifying and reporting potential change issues provides the “early warning” needed to avoid potential conflicts and disputes over change issues as they arise.

To avoid construction Contractor claims effectively, the following guidelines are recommended:

- Emphasize documentation and document controls to all project staff.
- Detailed Project Diaries; include phone conversations (written follow up) and any discussions.

- Good organization of all project records and claims documentation helps to retrieve these documents if necessary, at a later date, sometimes years later.
- Follow the conditions of the contract. By not following the conditions of the contract, the Contractor may later argue that the Department set a precedent contrary to the contract by neglecting to administer and enforce the requirements.
- Issue non-conformance notifications as required. If the Contractor is not following the contract, let them know clearly what the issue is and the required action and do this timely and in writing.
- Hold progress meetings with the Contractor frequently (at least weekly) to discuss issues, schedules, etc. Issue the meeting minutes as part of the project record.
- Do not allow issues to be ignored and become possibly inflammatory issues at the end of the project. Bring closure to all issues as soon as possible and try not to defer issues for resolution later.
- Track labor, equipment and materials for disputed items of work.

#### **109.09-1(b) Resident's Responsibilities**

Management at the project site can play an important role in minimizing problems and avoiding disputes. Following are some tools for accomplishing this:

- Ensure that the good practice guidelines as listed in the "Construction Inspector's Checklist for Contract Administration" and Section A of the IDOT Documentation of Contract Quantities are met.
- Review and discuss the project schedule with the Contractor.
- Recognize unreasonable or inaccurate schedules and define this to the Contractor, in writing, and require an updated schedule.

A photo/video history is a good means of recording progress, equipment in use and conditions.

#### **109.09-2 Claims Review**

This Section provides the Residents, Construction Field Engineers/Area Supervisors and District Construction Engineers with a uniform set of guidelines that may be used as a reference in addressing claims made by Contractors on construction projects. Knowledge of the examples included, plus familiarity with the contract documents, will assist engineers when analyzing contract claims. Proper analysis of contract claims will preclude recommendations of settlements that exceed Department policies or may establish potentially costly precedents.

The Department's philosophy in addressing construction contract claims is predicated on the concept of equitable treatment for the Contractor and the Department as owner. Several

questions should be addressed before making recommendations or decisions on claim settlements:

1. Has the Contractor been damaged?

If the Contractor has not suffered a documented financial loss or delay resulting from circumstances or events related to the contract, compensation is generally not granted.

2. Is the amount of the damage claim fair?

The Contractor may not be awarded settlements that exceed documented actual expenses. Assumed loss of profits or pro rata overhead costs are generally not recognized. Once entitlement is recognized, real costs that are not precluded by contract terms may be considered.

3. Is the payment excluded under the contract terms?

The requirements set forth in the contract documents may exclude entitlement for excusable delays and/or compensable damages resulting from compliance with the provisions of the contract. Claims are generally not considered where excluded by “no damage” terms in the contract.

4. Has the Contractor been asked to assume an unfair risk?

Occasionally, “no damage” or exculpatory terms may be considered when the adverse or damaging conditions exceed those contemplated by the contract. It is prudent to consider what was contemplated by the contract when analyzing this type of claim.

5. Would settlement establish an undesirable precedent?

Claims practices and procedures are based to a large extent on precedents established by past settlements. In analyzing claims, the impact a settlement may have in setting a precedent for future claims must be recognized in reaching a recommendation. The risk of establishing a damaging precedent is greatly increased when commitments are made prior to claims settlement.

### **109.09-3    Types of Costs**

The following are examples of costs that are typically claimed by Contractors together with the Department’s position on whether such costs are compensable and, if so, to what extent. Entitlement must be established before any costs are considered compensable:

1. Idled Equipment. Equipment required for a work operation that is idled and cannot be used on other work due to a compensable delay caused by the Department.

This is an identifiable cost and the hours claimed for reimbursement for the idled equipment must be documented by the Resident for future reference. Payment for idled equipment will be made in accordance with Article 109.04(b)(4). The Contractor has an obligation to minimize idled equipment expenses to the extent practical. Payment for

removing the equipment from the project should be considered if it is more economical than keeping it idled on the jobsite.

2. Idled Personnel. The labor force required for a work operation that is idled and cannot be used on other work due to a compensable delay caused by the Department.

This is a compensable cost which should be paid for in accordance with Articles 109.04(b)(1) and (2), without additives, for the time between the start of delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Salaried employees of the Contractor who are idled may be paid for the duration of the delay depending on the nature of their occupation. For example, an idled paving superintendent and plant operator would be eligible for compensation.

General superintendents, mechanics, and bookkeepers would not be paid unless all progress on the contract is delayed. Payment will be considered only for those hours solely attributable to the contract for which complete documentation is provided.

3. Increased Wage Rates and Material Costs. Added costs that a Contractor incurs when a compensable delay causes work, which otherwise would have been completed, to be performed after labor and material costs have increased.

Such costs are compensable only to the extent that the delay actually impacted the work operation. For example, a Contractor's paving operation is delayed for two weeks due to an act of the Department. During the two-week period, only seven working days are available because of rain. One week after resuming work, the Contractor is required to pay increased wage rates due to a new collective bargaining agreement. The Contractor is entitled to compensation for the difference in wage rates for those workers included in the paving operation for a period of seven days only — not the entire remaining paving operation.

4. Jobsite Overhead. Includes the cost of items such as salaried personnel, rental of office space, lease of plant and storage sites, telephones and utilities.

If a compensable delay affects a controlling item or the entire project such that the Contractor is required to remain at the project site for a longer duration, jobsite overhead may be considered to be compensable.

Each item of the jobsite overhead must be reviewed independently rather than accepting a daily or percentage rate. The cost of utilities will generally be directly related to the duration of use. However, rental or lease arrangements may be on a monthly, semi-annual or annual basis and not be affected by the delay. Salaried personnel who were compensated as "idled personnel" should not be included in jobsite overhead.

5. Loss of Efficiency. A reduction in labor or equipment productivity due to an act or omission of the Department. Such reductions in productivity must be documented to be compensable.

When a Contractor is delayed and is required to deviate from the progress schedule, the Contractor may claim that the work efficiency “built into” the schedule is lost, resulting in added costs. Similarly, when the Department decides to pay the premium portion of overtime rather than granting an extension of time, it may be claimed that work productivity declines due to the sustained work hours also resulting in added costs. Such added costs may be determined in accordance with the Department’s policy on acceleration. See Section 108.03.

6. Loss of Use of Money or Interest. A cost that reflects the time value of money.

If a Contractor incurs “out of pocket” costs, it may claim that he was unable to invest funds equal to those costs in the marketplace or conversely was required to pay interest on money borrowed to meet those costs for the period from when the costs were incurred until the claim is settled.

Whether such claims have merit is a moot point. The Court of Claims has never awarded interest because there is no basis in the Mechanic’s Lien Act for levying interest against the State. Such claims are therefore non-compensable.

7. Loss of Anticipated Profit. Profit is the excess of returns over expenditures on a business venture.

The amount of profit that a Contractor realizes on a project is dependent upon the profit factor included in the bid to remain competitive, actual productivity compared to planned productivity, weather, strikes, increased material costs, etc.

If a Contractor is required to perform added work beyond the original scope of the contract, such work is paid for on the basis of contract bid prices, agreed prices or force account, each of which provides for a profit factor.

If a Contractor incurs out of pocket costs in performing the original scope of work and is compensated for those costs, then the margin of profit on the original scope of work has not been diminished.

No allowance will be made for any loss of anticipated profit.

8. Preparation of Claims. A cost incurred by a Contractor in preparing and submitting a claim for additional compensation or time.

If a Contractor desires to pursue additional compensation or time, it should bear the cost of establishing entitlement and documenting associated costs. The Department also incurs costs as part of the claims settlement process in the form of review time, meetings, preparation of correspondence and, in some instances, attorney and consultant fees.

Costs for preparing claims are not considered compensable.

**109.09-4     Processing**

Claims for additional compensation that are supported by the Region Engineer must be submitted to the Central Bureau of Construction together with the District's supportive recommendation as to entitlement. The recommendation of the local agency should also be submitted for claims on FAS and FAUS contracts awarded by the Department.

If the District and Central Bureau of Construction agree that entitlement has been established, the District will review the Contractor's records in accordance with the above guidelines and refer to Article 109.09 to verify the amount of entitlement due the Contractor.

The District will then submit a supportive recommendation as to the amount of the proposed settlement to the Central Bureau of Construction.

Requests for extensions of time will be reviewed in accordance with Article 108.08 of the *Standard Specifications* and Section 108.08 of the *Construction Manual*.

Contractor: Rowe Construction Co.  
 CtrNumber: 5183  
 Contract: 70767  
 County: MCLEAN

**Illinois Department of Transportation**  
**Division of Highways**  
**Report of Resident**  
**Line Item Detail of Completed Work-In-Place**

Pay Estimate Number: 4

Route: FAP 730, FAP 322  
 Section: (57-20,57-1)RS&56RS-3  
 Job Number: C-95-024-09  
 Resident: William Parker, Jr.  
 (309)827-8867  
 Working Days Charged to Date: 34.50  
 Date From: 8/24/2016 To: 9/6/2016  
 SubJob: A FAS ID: Z001L01

| Pay Item Nbr | Quantity Awarded | Added by Authorization | Deducted by Authorization | Adjusted Total Quantity | Completed at Last Report | Total Completed to Date |
|--------------|------------------|------------------------|---------------------------|-------------------------|--------------------------|-------------------------|
| XZ193400     | 1.000            | 0.000                  | 0.000                     | 1.000                   | 0.000                    | 0.000                   |
|              |                  |                        |                           |                         |                          |                         |
| X4400196     | 1,016.000        | 0.000                  | 0.000                     | 1,016.000               | 1,016.000                |                         |
| X4406255     | 302.100          | 0.000                  | 0.000                     | 302.100                 | 302.100                  |                         |
| X4421000     | 138.000          | 0.000                  | 0.000                     | 138.000                 | 108.600                  |                         |
| X6311217     | 1.000            | 0.000                  | 0.000                     | 1.000                   | 0.000                    |                         |
| X7015005     | 7.000            | 0.000                  | 0.000                     | 7.000                   | 7.000                    |                         |
| X7830070     | 16,001.000       | 0.000                  | 0.000                     | 16,001.000              | 0.000                    |                         |
| X7830074     | 87.000           | 0.000                  | 0.000                     | 87.000                  | 0.000                    |                         |
| X7830076     | 1,448.000        | 0.000                  | 0.000                     | 1,448.000               | 0.000                    |                         |
| X7830077     | 62.000           | 0.000                  | 0.000                     | 62.000                  | 0.000                    |                         |
| X7830078     | 62.000           | 0.000                  | 0.000                     | 62.000                  | 0.000                    |                         |
| X7830090     | 58.000           | 0.000                  | 0.000                     | 58.000                  | 0.000                    |                         |
|              | 320.000          | 0.000                  | 0.000                     | 320.000                 | 320.000                  |                         |
|              | 52.000           | 0.000                  | 0.000                     | 52.000                  | 52.000                   |                         |
|              | 22,056.400       | 0.000                  | 0.000                     | 22,056.400              | 6,630.500                | 8,569.200               |
|              | 1,192.800        | 0.000                  | 0.000                     | 1,192.800               | 0.000                    | 1,192.800               |
|              | 369.400          | 0.000                  | 0.000                     | 369.400                 | 145.500                  | 232.600                 |
|              | 1,971.500        | 0.000                  | 0.000                     | 1,971.500               | 0.000                    |                         |

Route: FAP 730, FAP 322  
 Section: (57-20,57-1)RS&56RS-3  
 Job Number: C-95-024-09  
 Resident: William Parker, Jr.  
 (309)827-8867  
 Working Days Charged to Date: 34.50  
 Date From: 8/24/2016 To: 9/6/2016  
 SubJob: A FAS ID: Z001L02

Illinois Department of Transportation  
 Division of Highways  
 Report of Resident  
 Line Item Detail of Completed Work-In-Place

Pay Estimate Number: 4

Contractor: Rowe Construction Co.  
 CtrNumber: 5183  
 Contract: 70767  
 County: MCLEAN

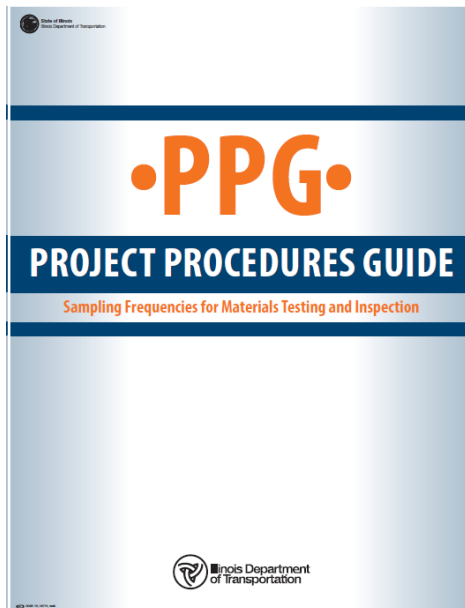
| Pay Item Nbr | Quantity Awarded | Added by Authorization | Deducted by Authorization | Adjusted Total Quantity | Completed at Last Report | Total Completed to Date |
|--------------|------------------|------------------------|---------------------------|-------------------------|--------------------------|-------------------------|
| X9500201     | 0.000            | 0.000                  | 0.000                     | 0.000                   | 0.000                    | 0.000                   |
| X9500600     | 0.000            | 0.000                  | 0.000                     | 0.000                   | 0.000                    | 0.000                   |

Resident: William Parker Jr. Regional Engineer: Kenil A. Garnett wsp  
 Date Prepared: 9/6/16 Date Mailed: 9/6/16

**Note: "Engineer of Record" must be signing pay estimate and a signed file copy must be retained in the jobsite project records as per Const. Man. 109.07-1(b)**



# Project Procedures Guide - Key Sections



## PPG Section 300 – Responsibilities of Resident

- Ensures all materials are inspected and approved
  - Ensures that the sampling and testing are in accordance with the PPG
  - Communicates with the District Materials office ensuring all testing is accomplished
- Should not include and pay item on the pay estimate for which there is no evidence of material inspection or approval
  - Force Account and Agreed Unit Price pay items shall be treated the same as contract pay items

## PPG Section 400 – Responsibilities of Contractor

- Provide materials that meet or exceed specification requirements
- Provide IDOT with required evidence of inspection prior to incorporating material into project
- Give IDOT advance notice to have sampling and testing performed for source inspection

## IDOT MATERIALS STAMPS, TAGS, AND LA-15

To provide **Evidence of Materials Inspection** for inspected material delivered to construction projects, the **Department** has developed stamps, tags, and forms to assist in identifying sampled, tested, and/or inspected materials.

A **Department** materials **Inspector** uses one or more of these stamps or tags to provide **Evidence of Materials Inspection** for the **Resident**. Each materials **Inspector** is provided with a unique ILL OK number. When an item is stamped or tagged “ILL OK” and the material id designated for a specific contract, the materials **Inspector** will later report the inspection in **MISTIC**. The stamp is a 1.25-inch diameter circle with .25-inch letters/numbers (see example on the next page). A list of each stamp numbers and the associated **Department** materials **Inspector** can be found on the [IDOT Website](#), Material Approvals–Metals & Miscellaneous, References, Material Specific Information, Illinois OK Stamps.

The **Department** also utilizes consultant **Inspectors** for some materials inspection. Currently, the use of an ILL OK stamp is limited to several employees of one consultant performing inspection on precast, prestressed products. The stamp is a 2.5-inch diameter circle with .25-inch letters/numbers. The company name or initials is on the top, the stamp number is in the middle and “ILL OK” is on the bottom. The unique ILL OK stamp design for this consultant and a list of each stamp number and the associated **Inspector** name can be found on the [IDOT Website](#), under Doing Business/Material Approvals – Metals & Miscellaneous, References, Material Specific Information, Illinois OK Stamps.

The Suppliers Certification of Shipment of Approved Material (Form LA-15) for approved suppliers is intended for use with materials which are tested and approved at the source by specific lots, batches, or quantities and stored for later delivery to a jobsite (e.g. paint, thermoplastic, glass beads, pavement marking tape, cable, etc.).

The **Department** gives the supplier blank LA-15 forms and keeps track of the Ticket Numbers on the forms given to the supplier. Then, with each shipment of approved materials, the supplier sends a completed LA-15 form, certifying that the specific material has been inspected by the **Department** and is approved. The completed LA-15 form includes the source and destination of the material and the Test Identification, Lot, or Batch numbers.

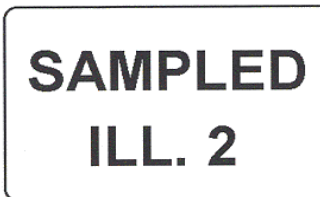
The **Resident** receives the LA-15 with the material shipment at the jobsite. The **Resident** may use the original LA-15 as **Evidence of Materials Inspection**. The **Resident** may be asked to assist in taking random jobsite samples.

The **Department** office that provided the LA-15 booklets to the supplier will be noted on each completed LA-15 form. The responsible District Materials Office will also receive a copy of the LA-15 and will enter the materials inspection assignment(s) in **MISTIC**. Subsequent **MISTIC** inspection reports (MIR-C08 or MIR-C01) should list the materials contained on the **Resident's** copy of the LA-15. These **MISTIC** reports, while not generally used as evidence of inspection themselves, validate the evidence of inspection and indicate that the materials inspection has been entered in **MISTIC**.

The following are examples of stamps, tags, and a completed LA-15 form.



This stamp indicates the product was approved at the source



This stamp shows the product has been sampled. It does NOT indicate the product is approved

Contractor SMITH, INC.

Size and Type #4 REBARS GR. 40

Quantity in this Shipment 3925 LB.

Form LS3 (32797—20M—10-82) (OVER)

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

BUREAU OF MATERIALS AND PHYSICAL RESEARCH

This material has been inspected at the source of supply, found to comply with the requirements of the specifications, and is accepted.

Inspected by R. JONES Date 6/10/99

District 93



**Illinois Department  
of Transportation**

**This is not an actual LA-15.  
It is for illustrative purposes only.**

**Supplier's Certification of  
Shipment of Approved Materials**

**Ticket No.**

|                      |                 |
|----------------------|-----------------|
| <b>Shipment From</b> |                 |
| <b>Supplier</b>      | R. A. Smith     |
| <b>Location</b>      | Springfield, IL |

|                     |          |
|---------------------|----------|
| <b>Shipment To</b>  |          |
| <b>Contractor</b>   | John Doe |
| <b>Contract No.</b> | 22222    |
| <b>Section</b>      |          |
| <b>County</b>       | Sangamon |

|                       |         |
|-----------------------|---------|
| <b>Invoice</b>        | 1212    |
| <b>Job No.</b>        | C922222 |
| <b>Municipality</b>   |         |
| <b>State P.O. No.</b> |         |

(If Applicable)

| Material Name/Code | Producer/Location | Previous Supplier/Loc. | Lot/ Batch | Test ID | Quantity | Unit  |
|--------------------|-------------------|------------------------|------------|---------|----------|-------|
| White Paint        | Dunn Paint        |                        | 195        | 951111  | 37       | gals. |
| Yellow Paint       | Dunn Paint        |                        | 295        | 952222  | 20       | gals. |
| Glass Beads        | Dunn Paint        | Sherwin Co.            | 22395      | 953333  | 5        | lbs.  |
|                    |                   |                        |            |         |          |       |
|                    |                   |                        |            |         |          |       |

Supplier certifies that the above material(s) has been loaded from stock material which has been tested, approved and released for shipment by the Illinois Department of Transportation.

*John Smith*

Signature of Supplier Representative

05-17-19

Date

The Illinois Department of Transportation (IDOT) regularly performs tests on the production and/or stock materials at the producer and/or supplier as a check on its quality control. The results of the tests and/or inspections may be obtained from the Illinois Department of Transportation.

White - Resident's copy  
Canary - Materials  
Pink - Supplier

District No.: 96

Central Office:

LA -15 (Rev. 2/95) IL 494-0804

## SOURCES OF INFORMATION FOR INSPECTORS

### CONTRACT DOCUMENTS (In governing order)

Special Provisions  
Approved Plans  
Recurring Special Provisions  
Supplemental Specifications  
Standard Specifications

### MANUALS<sup>1</sup>

[Construction Manual](#)

[Manual for Materials Inspection](#)

Manual of Test Procedures for Materials

[Manual for Fabrication of Precast Prestressed Products](#)

Manuals for Aggregate, Mixture Aggregate, HMA Levels I-III, HMA Nuclear Density, PCC Tester, and PCC Levels I-III courses <sup>2</sup>

Subgrade Stability Manual

1 – Unless otherwise noted, the manuals are available on the [IDOT Website](#), under Resources.

2 – Available for download at the Lake Land College web site, [QC/QA Training Manuals](#).

### POLICY MEMORANDUMS - BUREAU OF MATERIALS

The most current list of **CBM** Policy Memorandums may be found on the **Department's** web site, [IDOT Website](#), under "Doing Business/Material Approvals".

### ADDITIONAL DOCUMENTS

[Special Provision for Hot-Mix Asphalt – Hot-Mix Asphalt \(BDE\)](#)

[Special Provision for Hot-Mix Asphalt – Longitudinal Joint Sealant \(BDE\)](#)

Special Provision for Quality Control of Concrete Mixtures at the Plant (Check Sheet 30)

Special Provision for Quality Control/Quality Assurance of Concrete Mixtures  
(Check Sheet 31)

**NOTE** - This list of sources of information should be considered a dynamic list. Sources of information may be added to or deleted from this list at any time.

## FIELD ACCEPTANCE

Construction materials do not just “appear” on the jobsite. In many cases, the material has been pre-inspected or may have been produced under a **Department**-approved **Quality Control** program. **Evidence of Materials Inspection** is the minimum proof that **Method of Acceptance** sampling and testing has been performed. This attachment identifies the type of evidence that is required. Additional information on **Evidence of Materials Inspection** may be found in the [Manual for Materials Inspection](#). It is not always possible to update all documents concurrently. In case of a conflict, the [Manual for Materials Inspection](#) shall take precedence. If the **Evidence of Materials Inspection** is not clear, contact the Bureau of Materials for assistance.

This attachment does not describe the detailed **Method of Acceptance** sampling and testing requirements. Detailed information regarding materials inspection programs such as certified products, **Quality Management Programs**, and warehouse inspections may be found in the [Manual for Materials Inspection](#).

### Column 1 - Product

The table is arranged in alphabetical order by type of material or construction. An attempt was made to include major items. If an item is not listed, contact the District Materials Engineer or the **Bureau**.

### Column 2- Material Series

The number in this column represents the first three digits of the **MISTIC** Material Code for the product. If the product spans several sequential Material Series, only the first is listed. This number may be used as a cross-reference to find more information about a product from the [Manual for Materials Inspection](#).

### Column 3 - Evidence of Materials Inspection

This column lists the minimum information that the **Project Inspector** needs to accept the material. Definitions of the most common methods are listed below. It is important to understand that other methods may also be appropriate. For example,

- A product TEST may be appropriate at any time as determined by the **Resident/Inspector**.
- In addition to the notation in this column, a **Visual Examination** always applies. A piece of paper or **Inspector's** stamp does not guarantee that all product defects were caught in the **QC** and **QA** process or that it was not damaged in transit. **Visual Examination** should be noted in writing by the Resident Engineer.
- A passing test result that has been reported in the **MISTIC** system is always acceptable **Evidence of Materials Inspection**.

**EVIDENCE****COMMENT**

BBS 59  
(BB59)

Report of acceptance of fabrication of structural steel. The Bureau of Bridges and Structures usually performs this type of inspection and testing.

BILL OF LADING  
(BOL)

A shipping ticket that accompanies a product to the job site and which identifies the product, source, and lot.

**CBM**  
(**CBM**)

Bureau of Materials approval letter specific to a batch/lot/heat, etc. for a specific contract or producer/supplier.

CERTIFICATION  
(CERT)

Manufacturer's written certification that indicates material complies with the specifications or contract. Supplier certifications are not acceptable.

DAILY PLANT  
REPORTS  
(DPR)

For HMA, reports generated that provide mixture test results and other production data. For non-**QMP** projects, Daily Plant Reports are the responsibility of the **Inspector**. For **QMP** projects, refer to the appropriate special provisions to determine responsibility for Daily Plant Reports. For example, for **QC/QA** for PCC, the Daily Plant Report is often only the form BMPR MI504 completed by the **Producer**, Contractor, etc. for aggregate gradations.

ILL OK STAMP  
(ILOK)

Material is stamped by an IDOT **Inspector** with an "ILL OK" stamp indicating prior inspection and acceptance. An inspection tag may be used as **Evidence of Materials Inspection** and approval. A Resident Engineer must make note of the stamp or collect the inspection tag to ensure proper documentation of material inspection.

LA-15  
(LA15)

This **Department** form is a supplier's certification indicating material is from approved stock. The form is sometimes used as a Bill of Lading to indicate prior approval. The form should include supplier, proper contract/job designation, material description, manufacturer, specific approved material (test ID number, lots, or batches), and quantity. Additional information on LA 15's is provided in Attachment 1.

QUALIFIED PRODUCT/  
PRODUCER LIST  
(LIST)

The material appears on a current list of **Department**-approved products or approved sources found at the **Department's** web site, [IDOT Website](#), under "Doing Business/Material Approvals." Contact the inspecting district's Materials Office for information on aggregates.

MARK  
(MARK)

A commercial label, tag, or other marking which indicates product specification compliance and/or an approved source/manufacturer. A Resident Engineer must make note of the label, tag, or other marking to ensure proper documentation of material inspection.

TEST  
(TEST)

Approved test result available via the **MISTIC** system or from locally performed lab or field tests (e.g., soil density).

**EVIDENCE****COMMENT**

TICKET  
(TICK)

A ticket from an approved source indicating **Department** material or aggregate quality and gradation, job designation, purchaser, and weight (if applicable).

VISUAL ACCEPTANCE  
(VIS)

A RE memo denoting visual inspection is required in the project file, and input into **MISTIC** is required. A Resident Engineer must make note of the visual acceptance to ensure proper documentation of material inspection.

**VISUAL  
EXAMINATION**  
(VISE)

Same as VIS, but no RE memo or input into **MISTIC** is required. A Resident Engineer must make note of the visual examination to ensure proper documentation of material inspection.



## MIXTURES and AGGREGATE

In addition to field tests, approval for aggregate and mixtures is based on other final acceptance criteria. The following items identify the initial method of approving such materials.

### AGGREGATE:

1. Approved Aggregate Producer (**CBM** List)
2. Approved quality and gradation (ticket) per current **CBM** policy memorandum
3. Verify quality and gradation (INV) if appropriate.

### HOT-MIX ASPHALT:

1. Approved plant and lab (**CBM**)
2. Approved/verified mixture design
3. Approved materials – Aggregate (above), Asphalt Binder (**CBM** list)
4. Compliance with mixture and compaction specifications (**QC/QA QMP** specifications or Sampling Schedule 4, as applicable).

### PORTLAND CEMENT CONCRETE:

1. Approved plant and lab (**CBM** and District)
2. Approved/verified mixture design
3. Approved materials – Aggregates (above), Cement and Finely Divided Materials (**CBM** lists), Admixtures (**CBM** list)
4. Compliance with **QC/QA QMP** or non-**QC/QA QMP** specifications and Sampling Schedule 3, as applicable.

### CONCRETE AGGREGATE MIXTURE (CAM II):

1. Approved plant and lab (**CBM** and District)
2. Approved/verified mixture design
3. Approved materials – Aggregates (above), Cement and Finely Divided Materials (**CBM** lists), Admixtures (**CBM** list)
4. Compliance with **QMP** or non-**QMP** specifications and Sampling Schedule 2, as applicable.

### LIME MODIFIED SOIL, LIME STABILIZED BASE AND SUBBASE, AND SOIL-CEMENT:

1. Approved/verified mixture design
2. Approved materials – Aggregates (above), Cement and Finely Divided Materials (**CBM** lists)
3. Compliance with specifications and Sampling Schedule 1 or 2, as applicable.

### **Column 4 - Jobsite Sample**

This column identifies sampling responsibilities of **Project Inspectors**. For mixture components, sampling is generally handled at the plant by **Plant Inspectors**. Additional sampling requirements for other non-jobsite samples are detailed in the [Manual for Materials Inspection](#). Non-jobsite samples, other than mixture component samples, are generally sampled by **District Inspectors** or **CBM** personnel.

An “NR” in this field indicates that a jobsite sample is not required. However, if the method of acceptance for a material is TEST and there is no evidence that the material has been sampled and tested, or if the material is suspect, the **Project Inspector** should obtain a sample and submit for testing. Other entries in this column direct the **Project Inspector** to sampling policy documents.

**Column 5 - Responsible Lab** – The **Bureau Laboratory** responsible for receiving samples and establishing the testing policy for a product. If the entry is “DI,” any testing is performed by **District Inspectors**.

|                           |               |               |
|---------------------------|---------------|---------------|
| AC – Analytical Chemistry | CM – Cement   | PC – Precast  |
| AG – Aggregate            | CN – Concrete | SL – Soils    |
| BC – Bituminous Chemistry | MT – Metals   | DI – District |
| BM – Bituminous Mixture   |               |               |

### Column 6 - Sample Size

When a field sample is required, the sample size is indicated in this column. (Contact the responsible lab for mix design sample sizes.) The following table summarizes the size of aggregate samples for gradation testing.

#### Fine Aggregate

|             |        |
|-------------|--------|
| FA1 – FA 24 | 25 lb. |
|-------------|--------|

#### Coarse Aggregate

|             |         |
|-------------|---------|
| CA1 - CA5   | 110 lb. |
| CA6 - CA11  | 55 lb.  |
| CA12 - CA15 | 35 lb.  |
| CA16        | 25 lb.  |
| CA17 - CA19 | 35 lb.  |
| CA20        | 25 lb.  |

### **LIMIT AGGREGATE SAMPLES TO 40 lb. PER BAG FOR SAFETY PURPOSES**

For select fill, 80 lb. of fine aggregate and 120 lb. of coarse aggregate are required to perform the internal friction angle, pH, resistivity, chlorides, sulfates, and organic content tests.

### Column 7 – Container

Samples submitted to the **Bureau Laboratory** must be clearly labeled with the name of the material on the body of the container.

Following are recommended container types:

1. Screw top metal container.
2. Plastic bag in double canvas sacks.
3. Canvas sacks secured with zip ties when specified. Do not use burlap or “sugar sacks” for fine aggregate.
4. Plastic/Polyethylene container/bucket with secured lid.

5. Friction top metal container.
  6. Telescoping (cardboard) carton.
  7. Fiber Carton 4" x 5" x 5", or large enough to fit core.
  8. Well packed.
  9. Securely fastened plastic bag in either a cardboard carton or a friction top metal container.
  10. Plastic bag inside canvas sack.
  11. Plastic/Polypropylene bag.
  12. Original manufacturer's package (unopened).
  13. Epoxy-lined friction top metal container.
  14. Concrete cylinder mold (tightly sealed).
  15. Test panel 18" x 18" x 3.5" (Steel 3/16 in. minimum thickness bottom and sides; Wood 3/4 in. minimum thickness bottom/1.5 in. minimum thickness sides).
- NOTE: Shotcrete samples shall be labeled with the following information:
- Date shotcrete was placed;
  - Name of material used from the QPL, [Packaged High Performance Shotcrete](#);
  - Name and phone number of the RE;
  - Contract number;
  - Measured air content of shotcrete; and
  - Any other job specific location of placement (for example, East Pier)
16. Heavy duty cardboard box sealed with security tape when specified.

#### **Column 8 - Small Quantity per Contract**

Small quantity is the recommended amount of a material per contract that can be accepted or certified without standard testing and documentation. Under no conditions are materials to be used from an unknown source. Alternative materials inspection requirements for small quantities are discussed in Section 600, SMALL QUANTITIES.

Quantities in excess of these amounts must be approved by the District Materials Engineer. For PCC and HMA, the small quantity criteria are for non-**QMP** work. **QMP** specifications provide specific small quantity criteria for PCC and HMA.

| Product                               | Material Series | Evidence of Materials Inspection | Jobsite Sample               | Responsible Lab | Sample Size                     | Container | Small Quant. Per Contract |
|---------------------------------------|-----------------|----------------------------------|------------------------------|-----------------|---------------------------------|-----------|---------------------------|
| <b>Adhesives</b>                      |                 |                                  |                              |                 |                                 |           |                           |
| ➤ Bonding epoxy                       | 427             | CERT or MARK                     | NR                           | CN              | -                               | 5 or 12   | N/A                       |
| ➤ Chemical Adhesive (Dowel & Tie Bar) | 427             | LIST                             | NR                           | MT              | -                               | -         | N/A                       |
| ➤ Glass Capsules for Anchor Bolts     | 427             | LIST                             | NR                           | MT              | -                               | -         | N/A                       |
| <b>Aggregate</b>                      |                 |                                  |                              |                 |                                 |           |                           |
| ➤ For Mixtures & Granular Use         | 001             | LIST + TICK                      | See Sampling Schedules       | DI              | See Field Acceptance – Column 6 | 3 or 4    | 500 TON                   |
| ➤ Lightweight, for P.C. Concrete      | 025             | CERT                             | See Sampling Schedules       | DI              | See Field Acceptance – Column 6 | 3         | N/A                       |
| ➤ Riprap, Concrete                    | 001             | LIST + TICK                      | NR                           | AG              | -                               | 3 or 4    | 20 TON                    |
| ➤ Riprap, Stone                       | 001             | LIST + TICK                      | NR                           | AG              | -                               | 3 or 4    | 20 TON                    |
| <b>Bridge Bearing Pads</b>            |                 |                                  |                              |                 |                                 |           |                           |
| ➤ Elastomeric (Whole pad)             | 703             | LIST + CERT                      | *Sample when notified by CBM | MT              | 1 Pad                           | -         | N/A                       |
| ➤ Fabric                              | 703             | LA15 or TEST                     | When directed                | MT              | 12" x 12"                       | -         | N/A                       |
| ➤ Pot & Disk Bearing (HLMR)           | 703             | CERT + CBM                       | NR                           | MT              | -                               | -         | N/A                       |
| <b>Bituminous Materials</b>           |                 |                                  |                              |                 |                                 |           |                           |
| ➤ PG Asphalt Binder                   | 101             | (LIST or TEST) + BOL             | See CBM Policy Memo          | BC              | 1 QT                            | 5         | N/A                       |
| ➤ Road Oil & Cutback Asphalt          | 103             | (LIST or TEST) + BOL             | NR                           | BC              | 1 QT                            | 1 or 5    | N/A                       |
| ➤ Emulsified Asphalt                  | 107             | (LIST or TEST) + BOL             | NR                           | BC              | 1 GAL uncut emulsion            | 4         | N/A                       |

| Product  | Material Series | Evidence of Materials Inspection | Jobsite Sample           | Responsible Lab | Sample Size                      | Container | Small Quant. Per Contract |
|--|-----------------|----------------------------------|--------------------------|-----------------|----------------------------------|-----------|---------------------------|
| <b>Hot Mix Asphalt</b>   |                 |                                  |                          |                 |                                  |           |                           |
| ➤ Hot Mix Asphalt  | 195             | DPR + TICK + TEST                | See Std. Specs.          | DI              | Per Manual Test Proc. for Mat'ls | 3         | Special Provision         |
| <b>Block/Brick</b>   |                 |                                  |                          |                 |                                  |           |                           |
| ➤ Clay or Shale Building Brick   | 704             | TEST                             | NR                       | CN              | 10 EA                            | 8         | 100                       |
| ➤ Clay or Shale Paving Brick   | 704             | TEST                             | NR                       | CN              | 10 EA                            | 8         | 100                       |
| ➤ Concrete Building Brick  | 251             | LIST                             | NR                       | CN              | 6 EA                             | -         | N/A                       |
| ➤ Concrete Masonry Units for Buildings/ Catch Basin/ Manhole/ Inlet/ Valve Vault | 251             | LIST                             | NR                       | CN              | 6 EA                             | 8         | N/A                       |
| ➤ Concrete Paver   | 251             | LIST                             | NR                       | CN              | 6 EA                             | -         | N/A                       |
| ➤ Precast Block Revetment Mat  | 251             | LIST                             | NR                       | CN              | 6 EA                             | -         | N/A                       |
| ➤ Precast Articulated Block Revetment Mat  | 251             | LIST                             | NR                       | CN              | 6 EA                             | -         | N/A                       |
| ➤ Segmental Concrete Block Walls (Retaining Wall)                                | 255             | LIST                             | NR                       | CN              | 6 EA                             | -         | N/A                       |
| <b>Bridge Rail</b>   |                 |                                  |                          |                 |                                  |           |                           |
| ➤ Railing  |                 |                                  |                          |                 |                                  |           |                           |
| - Structural Steel   | 541             | CBM                              | NR                       | MT              | See MMI                          | -         | N/A                       |
| - Aluminum, Steel, Stainless   | 541             | CERT or LA15                     | NR                       | MT              | See MMI                          | -         | N/A                       |
| ➤ Post, Anchoring Device   | 541             | CERT or LA15                     | NR                       | MT              | -                                | -         | N/A                       |
| <b>Cementitious Materials</b>  |                 |                                  |                          |                 |                                  |           |                           |
| ➤ Cement   |                 |                                  |                          |                 |                                  |           |                           |
| - Calcium Aluminate  | 379             | TEST                             | See Sampling Schedules   | CM              | 6 LB                             | 5 or 11   | N/A                       |
| - Portland or Blended  | 376             | (LIST or TEST) + BOL             | Yes, per CBM Policy Memo | CM              | 6 LB                             | 5 or 11   | N/A                       |
| - Rapid Hardening  | 379             | LIST                             | NR                       | CN              | 3-5 as sold bags                 | 4 or 12   | N/A                       |

| Product   | Material Series | Evidence of Materials Inspection | Jobsite Sample           | Responsible Lab | Sample Size | Container | Small Quant. Per Contract |
|---|-----------------|----------------------------------|--------------------------|-----------------|-------------|-----------|---------------------------|
| <b>Cementitious Materials, continued</b>  |                 |                                  |                          |                 |             |           |                           |
| ➤ Finely Divided Minerals- Fly Ash, Ground Granulated Blast-Furnace Slag, Microsilica, High-Reactivity Metakaolin | 378             | LIST or TEST                     | Yes, per CBM Policy Memo | CM              | 6 LB        | 5 or 11   | N/A                       |
| <b>Chemicals / Admixtures</b>   |                 |                                  |                          |                 |             |           |                           |
| ➤ HMA – Anti-Strip Additive for Bituminous Mixtures   | 434             | DPR                              | NR                       | BM              | 1 PT        | 1         | N/A                       |
| ➤ HMA – Asphalt Truck Release Agent   |                 | LIST                             | NR                       | BM              | 1 QT        | 4         | N/A                       |
| ➤ Calcium Chloride (Dry, Liquid)  |                 |                                  |                          |                 |             |           |                           |
| - Dust Palliative   | 804             | TEST                             | NR                       | AC              | 1 QT        | 4         | 1 TON or 500 GAL          |
| - PCC – Calcium Chloride Accelerator  |                 | CERT                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ CLSM – Air Entraining Admixture   | 421             | LIST                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ PCC – Corrosion Inhibitor   | 437             | LIST                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ PCC – Latex Emulsion  | 437             | CERT                             | NR                       | CN              | 1 QT        | -         | N/A                       |
| ➤ PCC - Air- Entraining Admixture   | 421             | LIST                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ PCC – Type A – G Admixture  | 437             | LIST                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ PCC – Rheology Modifying Admixture  | 438             | LIST                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ PCC – Viscosity Modifying Admixture   | 438             | LIST                             | NR                       | CN              | 1 QT        | 4 or 13   | N/A                       |
| ➤ PCC – Membrane Curing Compound  | 430             | LA15 or ILOK or TEST             | NR                       | CN              | 1 QT/LOT    | 4 or 13   | N/A                       |
| ➤ PCC – Membrane Curing Compound/ Linseed Oil Emulsion  | 430             | LA15 or ILOK or TEST             | NR                       | CN              | 1 QT/LOT    | 13        | N/A                       |
| ➤ Concrete Sealer   | 427             | LIST                             | NR                       | CN              | 1 QT        | 1 or 4    | N/A                       |
| ➤ Protective Coat (Linseed Oil/ Petroleum Spirits)  | 426             | LA15 or ILOK or TEST or CBM      | NR                       | AC              | 1 QT        | 1 or 13   | 55 GAL                    |
| ➤ Rock Salt, Sodium Chloride  | 804             | TEST                             | NR                       | AC              | 10 LB       | 4 or 13   | N/A                       |

| Product   | Material Series | Evidence of Materials Inspection                        | Jobsite Sample         | Responsible Lab | Sample Size                      | Container | Small Quant. Per Contract |
|---|-----------------|---|------------------------|-----------------|----------------------------------|-----------|---------------------------|
| <b>Chemicals / Admixtures, continued</b>  |                 |   |                        |                 |                                  |           |                           |
| ➤ Water, for concrete, mortar, or curing  | 425             | TEST  | If not potable         | AC              | 1 QT                             | 4         | N/A                       |
| ➤ Weed Killer   | 803             | MARK or VIS   | NR                     | AC              | -                                | -         | N/A                       |
| <b>Concrete</b>   |                 |   |                        |                 |                                  |           |                           |
| ➤ Polymer Concrete  | 216             | LIST  | NR                     | CN              | 1.5 FT <sup>3</sup>              | 12        | N/A                       |
| ➤ Portland Cement Concrete- Other than <b>QC/QA</b>                                   | 216             | DPR + TICK (TICK not req'd for volumetric mixer) + TEST | See Sampling Schedules | CN              | Per Manual Test Proc. for Mat'ls | -         | 100 CY                    |
| ➤ Portland Cement Concrete - <b>QC/QA</b>   | 216             | DPR + TICK (TICK not req'd for volumetric mixer) + TEST | Special Provision      | CN              | Per Manual Test Proc. for Mat'ls | -         | Special Provision         |
| ➤ CAM II – Cement Aggregate Mixture   | 218             | DPR + TICK (TICK not req'd for volumetric mixer) + TEST | See Sampling Schedules | CN              | Per Manual Test Proc. for Mat'ls | 14        | 600 SY                    |
| ➤ CLSM - Controlled Low-Strength Material   | 216             | DPR + TICK (TICK not req'd for volumetric mixer) + TEST | See Sampling Schedules | CN              | Per Manual Test Proc. for Mat'ls | -         | 50 CY                     |
| ➤ Non-Shrink Grout  | 216             | LIST  | NR                     | CN              | 3-5 bags                         | -         | N/A                       |
| ➤ Thin Polymer Overlay System for Bridge Decks  | 216             | LIST  | NR                     | CN              | -                                | -         | N/A                       |
| ➤ PCC – Curing Blanket- Burlap, Burlap/Poly, Waterproof Paper, White Poly, Cotton Mat | 702             | WISE  | NR                     | CN              | -                                | 11        | N/A                       |
| <b>Concrete, Precast</b>  |                 |   |                        |                 |                                  |           |                           |
| ➤ Architectural Products  | 250             | LIST  | NR                     | -               | -                                | -         | N/A                       |
| ➤ Bridge Beams  | 253             | LIST + ILOK   | NR                     | PC              | -                                | -         | N/A                       |
| ➤ Bridge Slabs  | 255             | LIST + ILOK   | NR                     | PC              | -                                | -         | N/A                       |
| ➤ Bridge- Three Sided Structure   | 484             | LIST + ILOK   | NR                     | PC              | -                                | -         | N/A                       |
| ➤ Drainage Products   | 252             | LIST+ MARK  | NR                     | PC              | -                                | -         | N/A                       |
| ➤ Noise Abatement Wall  | 255             | TEST  | NR                     | PC              | -                                | -         | N/A                       |
| ➤ MSE Retaining Wall  | 255             | LIST  | NR                     | PC              | -                                | -         | N/A                       |
| ➤ Modular Retaining Wall  | 255             | LIST  | NR                     | PC              | -                                | -         | N/A                       |

| Product  | Material Series | Evidence of Materials Inspection | Jobsite Sample | Responsible Lab | Sample Size          | Container | Small Quant. Per Contract |
|--|-----------------|----------------------------------|----------------|-----------------|----------------------|-----------|---------------------------|
| <b>Concrete, Precast, continued</b>                      |                 |                                  |                |                 |                      |           |                           |
| ➤ Traffic Barrier  | 255             | LIST                             | NR             | PC              | -                    | -         | N/A                       |
| ➤ R.O.W, Drainage, Section, & Permanent Survey Markers   | 260             | LIST                             | NR             | PC              | -                    | -         | N/A                       |
| ➤ Headwall   | 257             | LIST                             | NR             | PC              | -                    | -         | N/A                       |
| ➤ Bumper Blocks (Wheel Stops for Cars)                   | 255             | LIST                             | NR             | PC              | -                    | -         | N/A                       |
| ➤ Picnic Table, Trach Receptacle, Planter                | 259             | LIST                             | NR             | PC              | -                    | -         | N/A                       |
| ➤ Splash Blocks  | 285             | LIST                             | NR             | PC              | -                    | -         | N/A                       |
| <b>Concrete, Precast and Prestressed (Except Piling)</b> |                 |                                  |                |                 |                      |           |                           |
| ➤ Prestressed Products                                   | 275             | ILOK                             | NR             | PC              | -                    | -         | N/A                       |
| <b>Concrete Repair</b>                                   |                 |                                  |                |                 |                      |           |                           |
| ➤ Mortar, Polymer Modified Portland Cement               | 216             | LIST                             | NR             | CN              | One 50 LB bag        | -         | N/A                       |
| ➤ Rapid Hardening Cementitious Material                  | 221, 379        | LIST                             | NR             | CN              | 3-5 as sold packages | 4 or 12   | N/A                       |
| <b>Electrical</b>  |                 |                                  |                |                 |                      |           |                           |
| ➤ Cable, unit duct                                       | 305             | MARK                             | NR             | MT              |                      | -         | N/A                       |
| ➤ Conduit  |                 |                                  |                |                 |                      |           |                           |
| - Aluminum, plastic                                      | 311, 312        | LA15 or (CERT + MARK)            | NR             | MT              |                      | -         | N/A                       |
| - Flexible Steel, Steel                                  | 208, 313        | LA15 or (CERT + MARK)            | NR             | MT              |                      | -         | N/A                       |
| ➤ Detector Loop  | 316             | LA15 or (CERT + MARK)            | NR             | MT              |                      | -         | N/A                       |
| ➤ Fiber Optic Cable                                      | 315             | LA15 or (CERT + MARK)            | NR             | MT              |                      | -         | N/A                       |
| ➤ Ground Rod   | 316             | CERT or LA15                     | NR             | MT              |                      | -         | N/A                       |
| ➤ Wire, span or tether                                   | 306             | LA15 or TEST                     | NR             | MT              | 2 @ 4 FT             | -         | N/A                       |



| Product   | Material Series | Evidence of Materials Inspection   | Jobsite Sample | Responsible Lab | Sample Size               | Container | Small Quant. Per Contract |
|---|-----------------|--|----------------|-----------------|---------------------------|-----------|---------------------------|
| <b>Fencing</b>                                      |                 |  |                |                 |                           |           |                           |
| ➤ Fabric, Post, Wire                                | 575             | CERT or LA15   | NR             | MT              |                           | 8         | 300 LF                    |
| ➤ Glare Guard, Slats                                | 586             | VIS  | NR             | MT              |                           |           | N/A                       |
| <b>Guard Rail</b>                                   |                 |  |                |                 |                           |           |                           |
| ➤ Cable for Road Guard                              | 552             | LA15 or ILOK or TEST   | NR             | MT              | 2 @ 4 FT                  | -         | 100 LF                    |
| ➤ Fasteners   | 676             | (MARK + CERT) or TEST  | NR             | -               | -                         | -         | N/A                       |
| ➤ Steel Plate & Accessories                         | 551             | LIST + CERT  | NR             | MT              | -                         | -         | N/A                       |
| ➤ Steel Post  | 553             | CERT or LA15   | NR             | MT              | -                         | -         | N/A                       |
| ➤ Traffic Barrier Terminal End Section              | 556             | NCHRP 350 = (LIST + CERT) or LA15; Pdts. Not covered by NCHRP 350 = CERT or LA15 | NR             | MT              | -                         | -         | N/A                       |
| ➤ Wood Post, Plank                                  | 553             | CERT or MARK or LA15   | NR             | MT              | -                         | -         | N/A                       |
| ➤ High Tension Cable Median Barrier                 | 556             | LIST + CERT  | NR             | MT              | -                         | -         | N/A                       |
| <b>Joint Fillers and Sealers</b>                    |                 |  |                |                 |                           |           |                           |
| ➤ Mastic for Precast Concrete Pipe                  | 617             | CERT or LA 15  | NR             | BC              | 1 QT                      | 5         | N/A                       |
| ➤ Hot-Poured Sealer                                 | 619             | LA15 or ILOK or TEST or CBM  | NR             | BC              | 1 mfg. sealed box per lot | 12        | 200 LB                    |
| ➤ Cold-Poured Sealer                                | 619             | LA15 or ILOK or TEST   | NR             | BC              | 1 GAL per batch           | 5         | 200 LB                    |
| ➤ Polysulfide Sealer                                | 619             | CERT or LA15   | NR             | BC              | -                         | -         | N/A                       |
| ➤ Asphalt Fillers                                   |                 |  |                |                 |                           |           |                           |
| - PAF   | 620             | LA15 or ILOK or TEST   | NR             | BC              | 1 QT                      | 5         | 200 LB                    |
| - Fiber- Modified (Pavement Preserve.)              | 620             | CERT   | NR             | BC              | -                         | -         | N/A                       |
| ➤ Preformed- Bituminous, cork, foam, fiber, plastic | 616             | LA15 or TEST   | NR             | BC              | 2 SF                      | 9 or 12   | 300 LF                    |
| ➤ Preformed Elastomeric Compression                 | 619             | LA15 or TEST or CBM  | NR             | MT              | 1 @ 6 FT                  | 12        | 100 LF                    |
| ➤ Preformed Neoprene, EPDM                          | 621             | LA15 or TEST   | NR             | MT              | 1 LF-Neoprene; 2 LF-EPDM  | -         | 100 LF                    |

| Product                                     | Material Series | Evidence of Materials Inspection                  | Jobsite Sample | Responsible Lab | Sample Size    | Container | Small Quant. Per Contract |
|---|-----------------|---|----------------|-----------------|----------------|-----------|---------------------------|
| <b>Joint Fillers and Sealers, continued</b> |                 |   |                |                 |                |           |                           |
| ➤ PCC - Silicone                            | 619             | CERT or MARK (if it contains spec. info.) or LA15 | NR             | AC              | -              | -         | N/A                       |
| ➤ Water Seal, PVC                           | 618             | LA15 or TEST                                      | NR             | MT              | 1 LF per batch | -         | 100 LF                    |
| <b>Landscaping</b>                          |                 |   |                |                 |                |           |                           |
| ➤ Agricultural Lime (Dept of Ag. Program)   | 002             | LIST + TICK                                       | NR             | AG              | 9 LB           | 2 or 10   | N/A                       |
| ➤ Excelsior Blanket                         | 562             | CERT or LA15                                      | NR             | MT              |                | 9 or 11   | 200 SY                    |
| ➤ Fertilizer                                | 561             | CERT (bulk) or MARK (bags)                        | NR             | MT              | -              | -         | 20 LB                     |
| ➤ Mulch - Straw                             | 562             | VIS   | NR             | MT              | -              | -         | N/A                       |
| ➤ Mulch- Paper, Wood cellulose              | 562             | MARK or CERT                                      | NR             | MT              | -              | -         | N/A                       |
| ➤ Compost                                   | 563             | CERT  | NR             | MT              | -              | -         | N/A                       |
| ➤ Peat Moss                                 | 563             | CERT or ILOK or LA15                              | NR             | MT              | -              | -         | N/A                       |
| ➤ Seed, Sod                                 | 563, 567        | CERT or ILOK or LA15                              | NR             | MT              | -              | -         | N/A                       |
| ➤ Trees, Shrubs, Plants                     | 565             | DOA CERT  | NR             | MT              | -              | -         | N/A                       |
| <b>Lighting and Signals</b>                 |                 |   |                |                 |                |           |                           |
| ➤ Controllers & Cabinets                    | 330             | VIS compared to approved submittals + CERT        | NR             | -               | -              | -         | N/A                       |
| ➤ Lamps, Luminaires & Ballast               | 330             | VIS compared to approved submittals + CERT        | NR             | -               | -              | -         | N/A                       |
| ➤ Traffic Signal Components                 | 335             | VIS compared to approved submittals + CERT        | NR             | MT              | -              | -         | N/A                       |
| ➤ Break-away Supports                       | 335             | VIS compared to approved submittals + CERT        | NR             | MT              | -              | -         | N/A                       |
| ➤ Poles                                     |                 |   |                |                 |                |           |                           |
| - Steel, Aluminum                           | 331             | CERT or ILOK                                      | NR             | MT              | -              | -         | N/A                       |
| - Wood                                      | 331             | MARK  | NR             | MT              | -              | -         | N/A                       |

| Product   | Material Series | Evidence of Materials Inspection | Jobsite Sample | Responsible Lab | Sample Size | Container | Small Quant. Per Contract |
|---|-----------------|----------------------------------|----------------|-----------------|-------------|-----------|---------------------------|
| <b>Lighting and Signals, continued</b>  |                 |                                  |                |                 |             |           |                           |
| ➤ Mast Arm Assemblies   | 330             | CERT                             | NR             | -               | -           | -         | N/A                       |
| ➤ Composite Handholes & Gulfbox   | 261             | CERT                             | NR             | PC              | -           | -         | N/A                       |
| <b>Lumber / Timber</b>  |                 |                                  |                |                 |             |           |                           |
| ➤ Treated or Untreated Lumber   | 351             | CERT or MARK or LA15             | NR             | MT              | -           | -         | N/A                       |
| <b>Metal Products, Miscellaneous</b>  |                 |                                  |                |                 |             |           |                           |
| ➤ Aluminum Drains   | 785             | LA15 or CERT                     | NR             | MT              | -           | -         | N/A                       |
| ➤ Copper Water Pipe   | 779             | MARK + CERT or LA15              | NR             | MT              | -           | -         | N/A                       |
| ➤ Name Plate  | 782             | LA15 or VIS                      | NR             | MT              | -           | -         | N/A                       |
| ➤ Rodent Shield   | 785             | VIS                              | NR             | MT              | -           | -         | N/A                       |
| ➤ Survey Markers  | 783             | LA15 or VIS                      | NR             | MT              | -           | -         | N/A                       |
| <b>Miscellaneous</b>  |                 |                                  |                |                 |             |           |                           |
| ➤ Manhole Step, Plastic   | 495             | CERT or LA15                     | NR             | MT              | -           | -         | N/A                       |
| ➤ Geotextile Fabric - French Drain, Ground Stabilization, Pipe Underdrain, Rip Rap, Silt Filter Fence, & Weed Barrier | 498             | CERT or LA15                     | NR             | MT              | -           | 8         | 400 SY                    |
| ➤ Concrete Revetment Mat Fabric   | 562             | LIST                             | NR             | MT              | -           | -         | N/A                       |
| <b>Paint</b>  |                 |                                  |                |                 |             |           |                           |
| ➤ Bridge Paint & Primer   | 414             | TEST (approved lot) or CBM       | NR             | AC              | 1 PT        | 13 or 4   | 20 GAL                    |
| ➤ Pavement Marking Paint  | 404             | TEST or LA15 or CBM              | NR             | AC              | 1 PT        | 13        | 20 GAL                    |
| <b>Pavement Marking</b>   |                 |                                  |                |                 |             |           |                           |
| ➤ Glass Beads   | 604             | TEST or LA15 or ILOK or CBM      | NR             | AC              | 1 QT        | 5         | 100 LB                    |
| ➤ Raised Pavement Marker  | 708             | LIST                             | NR             | AC              | -           | 8         | N/A                       |
| ➤ Temporary Pavement Tape   | 705             | TEST or LA15 or ILOK or CBM      | NR             | AC              | 10 LF       | 8         | N/A                       |
| ➤ Thermo Letters & Symbols  | 705             | CERT or LA15                     | NR             | AC              | -           | -         | N/A                       |

| Product  | Material Series | Evidence of Materials Inspection | Jobsite Sample | Responsible Lab | Sample Size                 | Container | Small Quant. Per Contract |
|--|-----------------|----------------------------------|----------------|-----------------|-----------------------------|-----------|---------------------------|
| <b>Pavement Marking, continued</b>                       |                 |                                  |                |                 |                             |           |                           |
| ➤ Thermoplastic - granular/block                         | 706             | TEST or LA15 or ILOK or CBM      | NR             | AC              | 1 GAL from 3 different bags | 5         | 100 LB                    |
| ➤ Thermoplastic Tape                                     | 705             | TEST or LA15 or ILOK or CBM      | NR             | AC              | 1 SF                        | 8         | 150 LF                    |
| <b>Piling</b>  |                 |                                  |                |                 |                             |           |                           |
| ➤ Metal Shell, Steel H, Steel Sheet or Steel Soldier     | 367             | CERT or LA15 or ILOK             | NR             | MT              | -                           | -         | N/A                       |
| ➤ Precast Concrete                                       | 366             | LIST + ILOK                      | NR             | PC              | -                           | -         | N/A                       |
| ➤ Precast, Prestressed Concrete                          | 366             | ILOK                             | NR             | PC              | -                           | -         | N/A                       |
| ➤ Timber   | 370             | CERT or MARK or LA15             | NR             | MT              | -                           | -         | N/A                       |
| <b>Pipe, Culvert and Drain</b>                           |                 |                                  |                |                 |                             |           |                           |
| ➤ Cast or Ductile Iron Pipe                              | 511             | CERT or LA15                     | NR             | MT              | -                           | -         | 100 LF                    |
| ➤ Metal Corrugated & Components                          | 452             | CERT or ILOK or LA15             | NR             | MT              | -                           | -         | 100 LF                    |
| ➤ Pipe - Plastic, PVC, HDPE - water/sewer                | 491             | ILOK or LA15 or TEST             | NR             | MT              | Per MMI                     | -         | 100 LF                    |
| ➤ Pipe Fittings - PE, PVC                                | 493             | VIS                              | NR             | MT              | -                           | -         | N/A                       |
| ➤ Pipe Liner- PE, PVC                                    | 496             | ILOK or LA15 or TEST             | NR             | MT              | 4 LF                        | -         | 100 LF                    |
| ➤ Pipe Underdrain  | 493             | ILOK or LA15 or TEST             | NR             | MT              | Per MMI                     | -         | 100 LF                    |
| ➤ Plastic Deck Drain                                     | 499             | CERT                             | NR             | MT              | -                           | -         | 100 LF                    |
| ➤ Precast Concrete Pipe or Box Culvert                   | 475             | LIST + MARK                      | NR             | PC              | -                           | -         | 100 LF                    |
| ➤ Underdrain Mat, Wall Drain                             | 496             | LA15 or TEST                     | NR             | MT              | 3 LF full width             | -         | 100 LF                    |
| <b>Signing</b>   |                 |                                  |                |                 |                             |           |                           |
| ➤ Completed Sign Panels & standard- Aluminum Sheeting    | 601             | LA15 or TEST or CBM              | NR             | AC              | 12" x 12"                   | 8         | N/A                       |
| ➤ Completed Sign Panels & standard - Reflective Sheeting | 602             | LA15 or TEST or CBM              | NR             | AC              | 13" x 13"                   | 8         | N/A                       |
| ➤ Post, Break-away                                       | 607             | CERT or LA15                     | NR             | MT              |                             | -         |                           |
| ➤ Post, Metal & Hardware                                 | 606             | CERT or LA15                     | NR             | MT              | -                           | -         |                           |
| ➤ Post, Tubular (round, rectangle)                       | 609             | LA15 or ILOK or TEST             | NR             | MT              | 1 LF                        | -         |                           |

| Product   | Material Series | Evidence of Materials Inspection | Jobsite Sample        | Responsible Lab | Sample Size                      | Container | Small Quant. Per Contract |
|---|-----------------|----------------------------------|-----------------------|-----------------|----------------------------------|-----------|---------------------------|
| <b>Signing, continued</b>   |                 |                                  |                       |                 |                                  |           |                           |
| ➤ Post, Steel Delineator  | 606             | CERT or LA15                     | NR                    | MT              | -                                | -         |                           |
| ➤ Post, Wood  | 610             | CERT or MARK or LA15             | NR                    | MT              | -                                | -         | N/A                       |
| ➤ Reflector, Delineator, Terminal   | 612             | LIST                             | NR                    | AC              | 3 EA per lot                     | 8         | N/A                       |
| ➤ Reflector, Prism  | 613             | LIST or CERT or LA15             | NR                    | AC              | 3 EA per lot                     | -         | N/A                       |
| ➤ Sign Structure, Overhead  | 613             | BB59 + CERT                      | NR                    | MT              |                                  | -         | N/A                       |
| ➤ Structural Fasteners  | 655             | CBM or LA15 or ILOK or TEST      | NR                    | MT              | 5 per lot                        | 4 or 11   | N/A                       |
| <b>Soil / Modification / Stabilization</b>  |                 |                                  |                       |                 |                                  |           |                           |
| ➤ Topsoil   | 563             | TEST                             | YES                   | SL              | 3 LB                             | 3 or 11   | N/A                       |
| ➤ For IBR - Fine-Grained Soil   | 563             | TEST                             | NR                    | DI/SL           | 75 LB                            | 3         | N/A                       |
| ➤ For IBR - Coarse-Grained Soil   | 563             | TEST                             | NR                    | DI/SL           | 100 LB                           | 3         | N/A                       |
| ➤ For Moisture Density - Fine-Grained Soil  | 563             | TEST                             | YES                   | DI/SL           | 30 LB                            | 3         | N/A                       |
| ➤ For Moisture Density - Coarse-Grained Soil  | 563             | TEST                             | YES                   | DI/SL           | 100 LB                           | 3         | N/A                       |
| ➤ Cement (Portland or Blended)  | 376             | (LIST or TEST) + BOL             | See Sampling Schedule | DI/SL           | 6 LB                             | 5 or 11   | 1 TON                     |
| ➤ Fly Ash   | 378             | LIST or TEST                     | See Sampling Schedule | CM              | 6 LB                             | 5 or 11   | 1 TON                     |
| ➤ Lime  | 003             | CERT + TEST                      | See Sampling Schedule | DI/SL           | 6 LB; 1 QT (slurry)              | 4 or 5    | 1 TON, 600 GAL (slurry)   |
| ➤ Modified Soil with Lime, Portland Cement, Portland Blast, Furnace Slag Cement, or Fly Ash | 750             | TEST                             | See Sampling Schedule | SL              | Per Manual Test Proc. for Mat'ls | 3 or 4    | 600 SY                    |
| ➤ Lime Stabilized Subbase or Base Course  | 750             | TEST                             | See Sampling Schedule | SL              | Per Manual Test Proc. for Mat'ls | 3 or 4    | 600 SY                    |
| ➤ Soil-Cement Base Course   | 750             | TEST                             | See Sampling Schedule | SL              | Per Manual Test Proc. for Mat'ls | 3 or 4    | 600 SY                    |

| Product                                   | Material Series | Evidence of Materials Inspection | Jobsite Sample                                  | Responsible Lab | Sample Size  | Container | Small Quant. Per Contract |
|---|-----------------|----------------------------------|---|-----------------|--|-----------|---------------------------|
| <b>Steel and Casting</b>                  |                 |                                  |   |                 |  |           |                           |
| ➤ Cast Frames & Grates/Lids               | 200             | CERT or LA15                     | NR  | MT              | -  | -         | 5 EA                      |
| ➤ Cast Manhole Steps                      | 210             | CERT or LA15                     | NR  | MT              | -  | -         | N/A                       |
| ➤ Deck Drains                             | 686             | CERT or LA15                     | NR  | MT              | -  | -         | N/A                       |
| ➤ Gabions, Slope Mattress                 | 680             | CERT or LA15                     | NR  | MT              | -  | -         | N/A                       |
| ➤ Pipe Casing                             | 680             | CERT or LA15                     | NR  | MT              | -  | -         | N/A                       |
| ➤ Steel Frames & Grates                   | 684             | CERT or LA15                     | NR  | MT              | -  | -         | N/A                       |
| <b>Steel, Miscellaneous</b>               |                 |                                  |   |                 |  |           |                           |
| ➤ Anchor Bolts                            | 676             | CBM or LA15 or ILOK or TEST      | NR  | MT              | 3 pieces of each full size or 3 FT plus threads from each heat     | -         | N/A                       |
| <b>Steel, Reinforcing</b>                 |                 |                                  |   |                 |  |           |                           |
| ➤ Dowel Bars - black or epoxy coated      | 626             | LIST + CERT                      | Yes, per CBM Policy Memo                        | MT              | 2 @ 6 FT EA for each size, grade and source                        | -         | N/A                       |
| ➤ Dowel Bar Assembly (Only)               | 627             | CERT or LA15                     | NR  | MT              | -  | -         | N/A                       |
| ➤ Pavement Fabric & Wire Mesh             | 628             | LIST + CERT                      | Yes, per CBM Policy Memo                        | MT              | See MMI  | -         | N/A                       |
| ➤ Prestressing Strand                     | 631             | CBM                              | NR  | MT              | 2 @ 4 LF for each reel   | -         | N/A                       |
| ➤ Reinforcing Bar – black or epoxy coated | 629             | LIST + CERT + MARK               | Yes, per CBM Policy Memo                        | MT              | 2 @ 6 LF   | -         | N/A                       |
| ➤ Rebar Splicers – black or epoxy coated  | 632             | LIST + CERT                      | Yes, if Contract Quantity of All Splicers > 100 | MT              | 3 assemblies each size and source - min. 18" of rebar on each side | -         | N/A                       |

| Product  | Material Series | Evidence of Materials Inspection                     | Jobsite Sample | Responsible Lab | Sample Size       | Container | Small Quant. Per Contract |
|--|-----------------|--|----------------|-----------------|-------------------|-----------|---------------------------|
| <b>Steel, Structural</b>   |                 |  |                |                 |                   |           |                           |
| ➤ Fasteners  | 655             | CBM or LA15 or ILOK or TEST                          | NR             | MT              | 5 pieces per lot  | 4 or 11   | N/A                       |
| ➤ Structural Steel   | 650             | BB59 + CERT  | NR             | MT              | -                 | -         | N/A                       |
| ➤ Stud Shear Connectors  | 658             | (MARK + CERT) or LA15                                | NR             | MT              | 5 pieces per lot  | 11        | N/A                       |
| <b>Temporary Items</b>   |                 |  |                |                 |                   |           |                           |
| ➤ See Sections 100, 500 Except                                   |                 | WISE   |                |                 |                   |           |                           |
| ➤ Reflective Materials   |                 | See Paint, Pavement Marking and Signing requirements |                |                 |                   |           |                           |
| <b>Waterproofing Materials</b>                                   |                 |  |                |                 |                   |           |                           |
| ➤ Asphalt Emulsion (Art. 1060.08                                 | 381             | (LIST or TEST) + BOL                                 | NR             | BC              | 1 GAL             | 4         | 55 GAL                    |
| ➤ Membrane System (Sec. 1061) - Coal-Tar Pitch Emulsion & Primer | 382, 386        | LA15 or TEST   | NR             | BC              | 1 QT EA           | 5         | 56 GAL                    |
| ➤ Membrane System (Sec. 1061) - Fabric, Glass                    | 385             | LA15 or TEST   | NR             | BC              | 1 @ 5 FT          | 8         | N/A                       |
| ➤ Reflective Crack Control (Sec.1062) - Reinforcing Fabric       | 498             | CERT or LA15   | NR             | MT              |                   | -         | N/A                       |
| ➤ Fiberglass Repair System (Sec. 1063) - Fiberglass Fabric       | 385             | LA15 or TEST   | NR             | BC              | 1 @ 5 FT          | 8         | N/A                       |
| ➤ Fiberglass Repair System (Sec. 1063) - Bit. Adhesive           | 385             | LA15 or TEST   | NR             | BC              | 1 mfg. sealed box | 12        | N/A                       |

Illinois Department of Transportation  
Bureau of Materials

Qualified Producer List  
**CERTIFIED PRECAST CONCRETE PRODUCERS**

**July 7, 2023**

This list supersedes the **May 26, 2023** list.

Standard Specifications for Road and Bridge Construction, Sections 522 and 1042

Guide Bridge Special Provision "Three Sided Precast Concrete Structure"

Contract Special Provision "Noise Abatement Wall"

Current Policy Memorandum "Quality Control / Quality Assurance Program for Precast Concrete Products"

For information regarding new product submittal, click the "New Submittal" bookmark to the left.

| <b>Producer/<br/>Supplier<br/>No.</b> | <b>Producer</b>               | <b>Location</b>     | <b>Prod. Mark <sup>A</sup></b> | <b>Products</b>   | <b>Resp<br/>Dist/<br/>CBM<sup>B</sup></b> |
|---------------------------------------|-------------------------------|---------------------|--------------------------------|---|---|
| 5482-01                               | Architectural Cast Stone      | W. Chicago, IL      |                                | <b>A:5</b><br><b>E:3,4</b><br><b>I:1,2,3</b>  | 1   |
| 7107-01                               | Great Lakes Concrete & Supply | Chicago Heights, IL | Great Lakes                    | <b>B:1,2</b><br><b>C:5</b><br><b>D:1,2,3,4,5,6,7,8,10</b><br><b>E:1,2,3</b><br><b>I:1,4</b> | 1   |
| 1062-01                               | Kieft Brothers Co.            | Elmhurst, IL        | Kieft Bros.                    | <b>B:1,2</b><br><b>D:1,2,3,4,5,6,7,10</b>   | 1   |
| 1442-01                               | Northfield Block Co.          | Mundelein, IL       |                                | <b>G:1,2,3,4,6</b>  | 1   |
| 2509-01                               | Norwalk Tank Co.              | Joliet, IL          | NTCO                           | <b>C:5,6</b><br><b>D:1,2,3,4,5,6,7,10</b><br><b>H:3</b><br><b>I:1</b>                       | 1   |
| 5086-01                               | Unilock Chicago, Inc.         | Aurora, IL          |                                | <b>G:5,6</b>  | 1   |
| 3505-01                               | Welch Brothers                | Elgin, IL           | WBE                            | <b>A:2</b><br><b>B:1,2</b><br><b>C:1,2,4,5</b><br><b>D:1,2,3,4,5,6,7,10</b><br><b>F:1</b>   | 1   |
| 3505-04                               | Welch Brothers                | Bartlett, IL        | WBE                            | <b>B:1,2</b><br><b>C:1,2,4,5</b><br><b>D:1,2,3,4,5,6,7,10</b><br><b>F:1</b>                 | 1   |
| 6542-01                               | Dukane Precast Inc.           | Naperville, IL      | DKN-N (Naperville)             | <b>A:1,3</b><br><b>F:1</b><br><b>G:1,2</b><br><b>H:1,2,3</b>                                | 1   |
| 7130-01                               | Des Plaines Material & Supply | Des Plaines, IL     |                                | <b>C:6</b><br><b>D:3,4,5,7</b>  | 1   |
| 4787-02                               | Schubert & Son Concrete       | Plainfield, IL      |                                | <b>D:3,4,5</b>  | 1   |



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Guide Bridge Special Provision "Three Sided Precast Concrete Structure"  
Contract Special Provision "Noise Abatement Wall"

Current Policy Memorandum "Quality Control / Quality Assurance Program for Precast Concrete Products"

Note 1: As of November 6, 2020, these locations were officially renamed from Concrete Specialties to Old Castle Infrastructure.

- A Product markings are applicable to products A1, A6, B1, B2, C1-7, D1-8, and F1. Refer to Attachment C in the current Bureau of Materials and Physical Research's Policy Memorandum, "[Quality Control/Quality Assurance Program for Precast Concrete Products](#)" for additional information regarding minimum identification markings. For traffic barrier, refer to Design and Environment Highway Standard 704001.
- B Central Bureau of Materials

Inspectors are reminded to visually inspect precast concrete products which arrive at the jobsite. Refer to Sections 23.0 and 24.0 in the current Bureau of Materials and Physical Research's Policy Memorandum, "[Quality Control/Quality Assurance Program for Precast Concrete Products](#)" for additional information on visually inspecting and repairing precast concrete products. Photographs of precast concrete products that are acceptable, unacceptable, and unacceptably repaired may be found by clicking [here](#). Regarding identification markings on a product, inspectors are reminded to verify the producer's mark to determine the actual manufacturer. Some precast concrete producers will acquire products from another manufacturer and resell it. Any questions on the acceptability of a product should be referred to the District Materials Engineer or Physical Test Engineer.

**Products Key:**

**A. Structural Members**

1. Bridge Slabs
2. Pile Caps
3. Other Structural Members
4. Piles and Extensions
5. Decorative Bridge Structural Elements
6. Three Sided Precast Concrete Structures

**B. Box Culvert**

1. Box Culvert Sections
2. Box Culvert End Sections

**C. Pipe**

1. Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
2. Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
3. Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
4. Concrete Sewer, Storm Drain, and Culvert Pipe
5. Reinforced Concrete Rectangular End Sections
6. Reinforced Concrete Flared End Sections
7. Reinforced Concrete Elliptical Flared End Sections

**D. Drainage Structures**

1. Inlet Boxes for Pipe Culverts and Medians  
Types 24A-G, 36A, 48A, and Flush Inlet Box for Median
2. Headwall for Pipe Drain
3. Catch Basins Types A, B, C, D
4. Manhole Type A
5. Inlets Types A, B
6. Drainage Structures Types 1, 2, 3, 4, 5, 6
7. Valve Vault Type A
8. Bridge Approach Drains
9. *Reserved*
10. Other Inlets (Applies when there is no Design and Environment Highway Standard.)

**E. Markers**

1. Right of Way
2. Drainage
3. Permanent Survey
4. Section

**F. Traffic Barrier**

1. Temporary Concrete Barrier

**G. Block/Brick**

1. Erosion Control: Precast Block Revetment Mats
2. Erosion Control: Precast Articulated Block Revetment Mats
3. Concrete Brick
4. Concrete Masonry Units
5. Concrete Pavers
6. Segmental Concrete Block Walls

**H. Walls**

1. Facing Panels for Mechanically Stabilized Earth Systems
2. Noise Abatement Walls (Reflective Type)
3. Modular Retaining Walls
4. Non-smooth Facing Panels for Mechanically Stabilized Earth Systems

**I. Miscellaneous**

1. Bumper Blocks (Wheel Stops For Cars)
2. Picnic Tables, Trash Receptacles, Planters
3. Splash Blocks
4. Handholes

The Products Key does not include composite concrete handholes (Article 1088.05/Design and Environment Highway Standards 814001 and 814006), composite concrete gulfbox junction (Article 1088.07(b)), precast concrete railroad crossings, or precast prestressed concrete products. In addition, clay paving bricks (Article 1041.01), decorative pavers and some special purpose blocks are not included.



# Illinois Department of Transportation

Office of Highways Project Implementation / Bureau of Construction  
2300 South Dirksen Parkway / Springfield, Illinois 62764

**Subject:**  
**Force Account Billing**  
**Article 109.04**

## **CONSTRUCTION MEMORANDUM 09**

**Effective:** April 1, 2021  
**Expires:** Indefinite

This memorandum supersedes Construction Memorandum 08-09 dated January 1, 2008.

Paying for extra work on a Force Account Basis is an accepted and common practice through-out the highway construction industry. The purpose of this memorandum is to provide direction to Department personnel for reviewing contractor force account billings. The Department utilizes Equipment Watch's Rental Rate Blue Book (Blue Book) as the source of equipment rates for force account billing.

Included in this memorandum are guidelines for force account billings and the following attachments:

Attachment 1: Rates for Items not Available from the Blue Book. The rates shown in Attachment 1 have been indexed to the 2021 preliminary United States Department of Labor, Bureau of Labor Statistics, Producer Price Index for Construction Machinery Manufacturing (PPI-CMM). (The preliminary PPI-CMM for January 2021 is 269.7.)

Attachment 2: [BC 635](#), Example Extra Work Daily Reports

Attachment 3: Sample Force Account Billing

Attachment 4: [BC 2370](#), Equipment Expense Rate Data

Attachment 5: Blue Book Supplemental Information

Particular attention should be paid to the following:

1. Each day that force account work is being performed Form BC 635, Extra Work Daily Report, must be completed. All labor, equipment and material used in the force account work shall be agreed to by both the Contractor and the Engineer and entered on this form at the end of each day. The Contractor must then prepare the force account bill from the daily reports. Only the labor, equipment and material shown on the daily reports shall be included on the force account bill.
2. The verification of labor cost and the affidavit as to materials taken from stock.
3. Payroll additives are to be restricted to actual costs.
  - a) Worker's compensation insurance is chargeable for all hours worked on a straight time basis. Overtime premiums (1 ½ x, 2 x, 3 x, etc.) are not eligible.

- b) Truck drivers' total salaries shall be excluded from computation of public liability and property damage insurance as these insurance costs are covered by equipment ownership expense.
  - c) Current Federal Unemployment Tax (i.e. unemployment insurance contribution) rate and contribution cap shall be obtained from the [current IRS Publication 15 "\(Circular E\), Employer's Tax Guide"](#). Year to date employee earnings are to be reported in the force account bill.
  - d) Up to date information regarding State Unemployment Insurance (UI) Tax can be obtained from the [State of Illinois Department of Employment Security website](#), specifically, the applicable year's "*State Experience Factor and Employers' UI Contribution Rates*" document. Year to date employee earnings are to be reported in the force account bill.
  - e) Current Federal Social Security Tax information can be located at the Social Security Administration's website, [www.ssa.gov/oact/cola/cbb.html](http://www.ssa.gov/oact/cola/cbb.html), or by web-searching "Social Security Administration- Contribution and Benefit Base". For example, Federal Social Security Tax is contributed at the rate of 6.2% plus 1.45% for Medicare, a total of 7.65%, on the first \$142,800 paid to an individual as wages in calendar year 2021. After the first \$142,800 in wages, the rate for Medicare continues at 1.45%.
4. The following policies shall be used in determining rates:
- a) Equipment owned by Contractor.
    - i) Equipment already on jobsite

The time paid for shall be the period that the equipment is in operation on the force account work, and in addition shall include traveling time to the locations of the force account work when the equipment is moved under its own power. (Loading and transportation costs will be allowed when equipment is moved through means rather than its own power.)
    - ii) Equipment not already on jobsite

Same as (i) except that minimum total operating time paid for on the work shall be not less than four hours.
- The hourly rates for Contractor owned equipment will be determined from the Equipment Watch Rental Rate Blue Book (Blue Book). The Blue Book is available via subscription only to select District Implementation Support staff as well as District Estimators.
- 1) The Blue Book will be used in the following manner:
    - (i) The hourly rate will be determined by using the FHWA Hourly Rate. The monthly, weekly, daily or hourly rates will not be used.

- (ii) The current revisions will be used in establishing rates. The current revision applicable to specific Force Account work is as of the first day of work performed on that Force Account work and that rate applies throughout the period the Force Account work is being performed.
- (iii) The Regional adjustment for Illinois will be made. Model year adjustment will also be made. No user defined adjustments will be made.
- (iv) The estimated operating costs per hour are included in the FHWA Hourly Rate and will be used for each hour that the equipment is in operation on the Force Account work. Such costs do not apply to idle time regardless of the cause of the idleness.
- (v) The rates established above include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs, overhaul and maintenance of any kind, depreciation, storage, overhead, profits, insurance and all incidentals. No additional compensation will be allowed for normal operating expenses. The rates do not include labor.
- (vi) The Contractor may submit Form BC 2370 Equipment Expense Rate Data Sheet to the Engineer with sufficient information for each piece of equipment and its attachments to enable the Engineer to verify the rental rate. As a preferred option, the Contractor may submit a copy of the printable report from the Blue Book. All equipment shall, in the opinion of the Engineer, be in good operating condition. Equipment used by the Contractor shall be specifically described and be of suitable size and suitable capacity required for the work to be performed.
- (vii) Standby time for equipment beyond the end of the shift when the delay occurred will not be paid for, except where the equipment has been held on the jobsite on a standby basis at the request of the Engineer. Such payment will be made based upon:

0.5 X (FHWA Hourly Rate adjusted for Model Year and Region - Estimated Operating Costs)

2) Rates for equipment not listed but available upon request from Blue Book:

Contractors with a subscription to the Blue Book can obtain a custom rate from Equipment Watch for equipment not listed. Alternatively, the Contractor may submit a fully completed BC 2370, Equipment Expense Rate Data sheet. BC 2370 information can be forwarded, by support staff, to Equipment Watch for a rate determination (see Attachment 5 for additional information).

3) Individual pieces of equipment not listed in Attachment 1 of this memorandum and having a replacement value of \$1,000 or less shall be considered to be tools or small equipment and no payment will be made for their use on the work. Compensation will be allowed for actual cost of consumables (oxygen, acetylene, propane, etc.) used by small tools.

b) Equipment rented by the Contractor.

- i) Whenever it is necessary for the Contractor to rent equipment elsewhere, they shall be paid the rental and transportation cost of such equipment to which 5% shall be added. The rental rates may not exceed those allowable for equipment owned by the Contractor unless first approved in writing by the Engineer before the work is started. In no case shall the rental rates exceed those of established distributors or equipment rental agencies.
- ii) When the Contractor rents equipment from a related party and that equipment was used in the determination of the Contractor's prequalification ratings, the Contractor shall be paid per a) above regardless of the rental agreement between the Contractor and the related party.

5. Preparation of force account bills.

All force account bills should show an accurate description of equipment used on force account work by year manufactured, type, size and horsepower and/or capacity.

Any changes or correction of ownership expense rates on a force account bill must be made in a manner that ensures the Contractor has been made aware of the revised amount before the bill will be approved for payment.

Contractors are eligible for an additive to a bill prepared by a subcontractor. See Art. 109.04(b)(7).

6. Response Contractors Indemnification Fund.

Pay item XXX15000 should be used when the force account or a portion thereof, involves issues related to a remedial or response action, or to the identification, handling, storage, treatment or disposal of a pollutant, or other items subject to payment into the Response Contractors Indemnification Fund (RCIF).

- 7. Where work extends over more than one week or payroll period, one bill should be submitted whenever possible, listing all labor together and all equipment together.
- 8. It will be proper to pay a foreman's salary based on the individual's actual wage and allow actual cost or company average for company contribution to life insurance, health insurance, or pension funds. We will also pay documented travel expense if it applies. Bonuses or profit sharing arrangements will not be allowed. Under some limited circumstances, the contractors' superintendent may act as a foreman. In those situations it may be appropriate to pay for those costs as normally would be done for a foreman.

9. Some flaggers may be shown simply under the laborer wage rate. Others may have a special wage rate for laborers when acting as flaggers. It is also possible for flagger's wage rates to be under traffic control workers rather than laborers. For force account bills the designation flaggers should be used if they are paid a different wage rate than laborers.



Tim Kell, P. E.  
Engineer of Construction

## **ATTACHMENT 1**

### **ITEMS NOT AVAILABLE FROM BLUE BOOK**

#### **ARROW BOARD**

**For vehicle mounting, rate for vehicle not included**

HOURLY EXPENSE RATE = *Flat rate for all models*

\$3.67 for all models for a maximum of 176 hours per month

STANDBY HOURLY RATE = Hourly Expense Rate x 0.897 x 0.50

#### **ATTENUATOR**

**Crash, for truck mounting, rate for truck not included, one-piece aluminum, one-piece fiberglass**

HOURLY EXPENSE RATE = *Flat rate for all types*

\$5.09 for all models for a maximum of 176 hours per month

STANDBY HOURLY RATE = Hourly Expense Rate x 0.942 x 0.50

**Crash, for truck mounting, rate for truck not included, two-piece aluminum**

HOURLY EXPENSE RATE = *Flat rate for all types*

\$6.74 for all models for a maximum of 176 hours per month

STANDBY HOURLY RATE = Hourly Expense Rate x 0.942 x 0.50

**Impact, sand module, temporary**

DAILY EXPENSE RATE = *Flat rate for all types*

\$8.31 for all models for a maximum of 180 days

#### **BARRICADE**

**Type I or Type II**

DAILY EXPENSE RATE = *Flat rate for all models*

\$1.50 for each type I or type II barricade for a maximum of 180 days

**Type III**

DAILY EXPENSE RATE = *Flat rate for all models*

\$3.52 for each type III barricade for a maximum of 180 days

#### **BARRIER WALL**

**Concrete, temporary; 12.5 ft section**

DAILY EXPENSE RATE = *Flat rate for all types*

\$0.47 for each section for a maximum of 180 days

**Lifting Clamp**

REIMBURSEMENT RATE = *Flat rate for all types*

\$0.37 for each section placed and removed

**DELINEATOR**

**Barrel**

DAILY EXPENSE RATE = *Flat rate for all types*

\$1.87 for each delineator barrel for a maximum of 180 days

**Cone**

DAILY EXPENSE RATE = *Flat rate for all types*

\$0.75 for each cone for a maximum of 180 days

**LIGHT**

**Flasher**

DAILY EXPENSE RATE = *Flat rate for all types*

\$0.30 for each flasher for a maximum of 180 days

**Hi-intensity, sign mounted**

DAILY EXPENSE RATE = *Flat rate for all types*

\$2.55 for each sign mounted hi-intensity lite for a maximum of 180 days

**Steady Burn**

DAILY EXPENSE RATE = *Flat rate for all types*

\$0.45 for each steady burn for a maximum of 180 days

**SIGN**

**Construction Work Zone**

DAILY EXPENSE RATE = *Flat rate for all types*

\$3.00 for each sign for a maximum of 180 days

**TRENCH BOX**

**Steel or aluminum, single or double wall; all lengths and depths; including braces**

NOTE: Area equals depth times length

HOURLY EXPENSE RATE = *\$0.064 times the box's area in square feet plus \$4.57  
for a maximum of 176 hours per month*

STANDBY HOURLY RATE = Hourly Expense Rate x 0.900 x 0.50




**Illinois Department  
of Transportation**
**Extra Work Daily Report**

County Christian

Section

Route IL-29

District 6

Contractor Smith Construction Co.

Contract No. 12345

Report No. 1 Date 05/05/2021

Job No. C-96-000-00

Authorization No. 05

Project No.

Description and Location of Work: Additional Pipe &amp; Collars at Station 05+05

**LABOR**

| Name, Worker Classification | Total Hours Worked<br>(Straight-Time) (Overtime) |
|-----------------------------|--|
| Matt Reilly, Foreman        | 6  |
| Tim Seitz, Laborer          | 6  |
| Bernie Henderson, Laborer   | 6  |
| Earl Roth, Laborer          | 6  |
| John Graham, Laborer        | 6  |
| Marlee Reid, Teamster       | 6  |
| Macy Smith, Operator        | 6  |
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**EQUIPMENT USED**
**MATERIAL USED**

| Description:<br>List Manufacturer, Model, Year Built, Capacity | Number of<br>Hours | Description | Quantity |
|--|--------------------|-------------|----------|
| 2020 Caterpillar 814 F Series II Wheel Dozer (253HP)           | 6                  |             |          |
| 2018 Chevy Light Duty P/U Truck, 4x4 Crew Cab 1/2 ton          | 6                  | 24 in RCP   | 64 ft    |
| 2017 On-Hwy Rear Dump Trk 4x4 Diesel 30,000lb/GVW              | 6                  |             |          |
|  |                    |             |          |
|  |                    |             |          |
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REMARKS:

APPROVED: R.L. Smith

Contractor's Representative

APPROVED: Stephanie Jones

State's Representative



# Illinois Department of Transportation

## Extra Work Daily Report

County Christian

Section

Route IL-29

District 6

Contractor Smith Construction Co.

Contract No. 12345

Report No. 2 Date 05/06/2021

Job No. C-96-000-00

Authorization No. 05

Project No.

Description and Location of Work: Additional Pipe &amp; Collars at Station 05+05

### LABOR

| Name, Worker Classification | Total Hours Worked<br>(Straight-Time) (Overtime) |
|-----------------------------|--|
| Matt Reilly, Foreman        | 8  |
| Tim Seitz, Laborer          | 8  |
| Bernie Henderson, Laborer   | 8  |
| Earl Roth, Laborer          | 8  |
| John Graham, Laborer        | 8  |
| Marlee Reid, Teamster       | 8  |
| Macy Smith, Operator        | 8  |
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### EQUIPMENT USED

### MATERIAL USED

| Description:<br>List Manufacturer, Model, Year Built, Capacity | Number of<br>Hours | Description     | Quantity  |
|--|--------------------|-----------------|-----------|
| 2020 Caterpillar 814 F Series II Wheel Dozer (253HP)           | 6                  |                 |           |
| 2018 Chevy Light Duty P/U Truck, 4x4 Crew Cab 1/2 ton          | 6                  | Trench Backfill | 48.6 tons |
| 2017 On-Hwy Rear Dump Trk 4x4 Diesel 30,000lb/GVW              | 6                  |                 |           |
|  |                    |                 |           |
|  |                    |                 |           |
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REMARKS:

APPROVED: R.L. Smith

Contractor's Representative

APPROVED: Stephanie Jones

State's Representative


**Illinois Department  
of Transportation**
**Extra Work Daily Report**

County Christian

Section

Route IL-29

District 6

Contractor Smith Construction Co.

Contract No. 12345

Report No. 3 Date 05/07/2021

Job No. C-96-000-00

Authorization No. 05

Project No.

Description and Location of Work: Additional Pipe &amp; Collars at Station 05+05

**LABOR**

| Name, Worker Classification | Total Hours Worked<br>(Straight-Time) (Overtime) |
|-----------------------------|--|
| Matt Reilly, Foreman        | 8 Straight, 2 OT                                 |
| Tim Seitz, Laborer          | 8 Straight, 2 OT                                 |
| Bernie Henderson, Laborer   | 8 Straight, 2 OT                                 |
| Earl Roth, Laborer          | 8 Straight, 2 OT                                 |
| John Graham, Laborer        | 8 Straight, 2 OT                                 |
| Marlee Reid, Teamster       | 8 Straight                                       |
| Macy Smith, Operator        | 8 Straight                                       |
|                             |  |
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**EQUIPMENT USED**
**MATERIAL USED**

| Description:<br>List Manufacturer, Model, Year Built, Capacity | Number of<br>Hours | Description                   | Quantity |
|--|--------------------|-------------------------------|----------|
| 2020 Caterpillar 814 F Series II Wheel Dozer (253HP)           | 8                  | PCC                           | 6 Sacks  |
| 2018 Chevy Light Duty P/U Truck, 4x4 Crew Cab 1/2 ton          | 10                 | Aggregate                     | 1.5 tons |
| 2017 On-Hwy Rear Dump Trk 4x4 Diesel 30,000lb/GVW              | 8                  | Form Lumber, 1in x 6in x 14ft | 24 pcs   |
|  |                    |                               |          |
|  |                    |                               |          |
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REMARKS:

APPROVED: R.L. Smith

Contractor's Representative

APPROVED: Stephanie Jones

State's Representative

**ATTACHMENT 3**

**This sample bill does not establish any policy relative to the amount to be allowed for any particular item of materials or equipment or as representing actual rates for insurance. Its sole purpose is to standardize the form of force account bills.**

**SAMPLE OF A FORCE ACCOUNT BILL (USING 2021 BLUEBOOK RATES) SHOWING FORM TO BE FOLLOWED**

**CONTRACTOR'S LETTERHEAD**

Route IL-29 Section \_\_\_\_\_ County Christian Auth. No. 05

Force account bill for Additional Pipe & Collars Contract No. 12345

Insert applicable dates

|   |                 |          |          | Total Hours |             | Rate  | Insurance Amount | Payroll Amount | Earnings to Date | Payroll Amount Eligible for Unemployment Tax |               |
|---|-----------------|----------|----------|-------------|-------------|-------|------------------|----------------|------------------|--|---------------|
|   | <u>May 2021</u> | <u>5</u> | <u>6</u> | <u>S.T.</u> | <u>O.T.</u> |       |                  |                |                  | <u>F.U.T.</u>                                | <u>S.U.T.</u> |
| Matt Reilly, Foreman  | 6               | 8        | 10       | 22          | 2           | 47.65 | \$1,143.60       | \$1,191.25     | \$35,000.00      | \$0.00                                       | \$0.00        |
| Tim Seitz, Laborer  | 6               | 8        | 10       | 22          | 2           | 43.47 | 1,043.28         | 1,086.75       | 9,000.00         | 0.00   | 1,086.75      |
| Bernie Henderson, Laborer   | 6               | 8        | 10       | 22          | 2           | 44.47 | 1,067.28         | 1,111.75       | 6,000.00         | 1,111.75                                     | 1,111.75      |
| Earl Roth, Laborer  | 6               | 8        | 10       | 22          | 2           | 40.39 | 969.36           | 1,009.75       | 7,100.00         | 909.75                                       | 1,009.75      |
| John Graham, Laborer  | 6               | 8        | 10       | 22          | 2           | 43.47 | 1,043.28         | 1,086.75       | 9,100.00         | 0.00   | 1,086.75      |
| Marlee Reid, Truck Driver   | 6               | 8        | 8        | 22          |             | 46.05 | 1,013.10         | 1,013.01       | 27,000.00        | 0.00   | 0.00          |
| Macy Smith, Operator  | 6               | 8        | 8        | 22          |             | 47.50 | 1,045.00         | 1,045.00       | 40,000.00        | 0.00   | 0.00          |
| Subtotals, Labor  |                 |          |          |             |             |       | \$7,324.90       | \$7,544.35     |                  | \$2,021.50                                   | \$4,295.00    |
| *Laborer Pension & Welfare Funds – 96 hours @ 33.32                           |                 |          |          |             |             |       |                  | 3,198.72       |                  |  |               |
| *Operating Engineer Pension & Welfare – 22 hours @ 40.65                      |                 |          |          |             |             |       |                  | 894.30         |                  |  |               |
| *Teamsters Pension & Welfare – 22 hours @ \$28.00                             |                 |          |          |             |             |       |                  | 616.00         |                  |  |               |
| Subtotals, Labor  |                 |          |          |             |             |       |                  | 12,253.37      |                  |  |               |
| Plus 35% of \$12,253.37   |                 |          |          |             |             |       |                  | 4,288.68       |                  |  |               |
| Subtotals, Labor  |                 |          |          |             |             |       |                  | 16,542.05      |                  |  |               |
| Plus: Worker's Compensation Ins. 10.75% of \$7,324.90                         |                 |          |          |             |             |       | 787.43           |                |                  |  |               |
| Public Liability and Property Damage Ins., excluding payroll of Truck Drivers |                 |          |          |             |             |       |                  | 331.37         |                  |  |               |
| **Federal Unemployment Tax 0.6% of \$2,021.50                                 |                 |          |          |             |             |       |                  | 12.13          |                  |  |               |
| ***State Unemployment Tax 7.25% of \$4,295.00                                 |                 |          |          |             |             |       |                  | 311.39         |                  |  |               |
| Federal Social Security Tax 7.65% of \$7,544.26                               |                 |          |          |             |             |       |                  | 577.14         |                  |  |               |
| Total Payroll Additives   |                 |          |          |             |             |       | 2,019.46         |                |                  |  |               |
| Plus 10% of \$2,019.46  |                 |          |          |             |             |       | 201.95           |                |                  |  |               |
| Subtotal  |                 |          |          |             |             |       |                  | 2,221.41       |                  |  |               |
| Total Labor   |                 |          |          |             |             |       |                  | 18,763.46      |                  |  |               |

\*These are not suggested rates, as these rates vary widely between Union Locals. This is intended as an example only.

\*\*Do not include costs for employees which have reached the \$7,000 ceiling on Federal Unemployment Tax (F.U.T.) (2021)

\*\*\*Do not include costs for employees which have reached the \$12,960 ceiling for State Unemployment Tax (S.U.T.) (2021)

I hereby certify that the above statement is a copy of that portion of the payroll which applies to the above stated work and that the rates shown for taxes and insurance are actual costs.

(Signed) \_\_\_\_\_

*R. L. Smith*

(Contractor)

| <u>May 2021</u>  | <u>5</u> | <u>6</u> | <u>7</u> | <u>Total Hrs</u> | <u>Rate</u> | <u>Amount</u>   |
|--|----------|----------|----------|------------------|-------------|-----------------|
| <u>Equipment Expense</u>                                   |          |          |          |                  |             |                 |
| 2020 Caterpillar 814F Series II Wheel Dozer, (253 HP)      | 6        | 6        | 8        | 20               | \$122.29    | \$2,445.80      |
| 2018 Chevy Light Duty Pickup Truck, 4X4 Crew Cab (1/2 ton) | 6        | 6        | 10       | 22               | \$22.25     | \$489.50        |
| 2017 On-Hwy Rear Dump Truck, 4X4, Diesel, (30,000 lb GVW)  | 6        | 6        | 8        | 20               | \$40.40     | <u>\$808.00</u> |
| Total Equipment Expense                                    |          |          |          |                  |             | \$3,743.30      |

Materials Used

|  |                 |
|--|-----------------|
| 24 in. R.C.P., 64 ft. @ \$47.40 per ft.(receipted invoice attached)                        | \$3,033.60      |
| Trench backfill, 48.6 tons @ \$16.50 per ton (taken from stock)                            | 801.90          |
| Portland cement, 6 sacks @ \$14.67 (taken from stock)                                      | 88.02           |
| Aggregate, 1.5 tons @ \$14.25 per ton (taken from stock)                                   | 21.38           |
| Form lumber, 24 pieces, 1x6, 14 feet long @ \$12.45 per piece (receipted invoice attached) | 298.80          |
| Less salvage value of form lumber, 50% ( <i>agreed to in field</i> )                       | <u>(149.40)</u> |
| Subtotal material  | 4,094.30        |
| Plus 15% on \$4,094.30   | <u>614.15</u>   |
| Total Materials  | \$4,708.45      |

**AFFIDAVIT**

This is to certify that the material entered on this force account bill which was taken from stock is shown at our cost.

\_\_\_\_\_  
Smith Construction Co.  
(Company)

By R. L. Smith

|                         |             |
|-------------------------|-------------|
| Total Labor             | \$18,763.46 |
| Total Equipment Expense | \$3,743.30  |
| Total Materials         | \$4,708.45  |
| Total                   | \$27,215.21 |
| Bond 0.75%              | \$204.11    |
| Plus 10% of Bond        | \$20.41     |
| Total Bill              | \$27,439.73 |

\_\_\_\_\_  
Resident


**Illinois Department  
of Transportation**
**Equipment Expense Rate Data**

**To Be Filled Out by the Requesting Agency or Contractor:**

|                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|
| Name                 |                      | Contract Number      |                      |
| <input type="text"/> |                      | <input type="text"/> |                      |
| Address              | City                 | State                | Zip Code             |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Phone                |                      |                      |                      |
| <input type="text"/> |                      |                      |                      |

**Description of Equipment**

|                      |                      |                      |                       |
|----------------------|----------------------|----------------------|-----------------------|
| Type                 | Make                 | Model                |                       |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |                       |
| Year Manufactured    | Fuel Type            | Horsepower           | Size and/or Capacity: |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/>  |

**Remarks**

**Cost of Equipment (For Equipment Not Listed in Blue Book)**

|   |                      |  |
|---|----------------------|--|
| Purchase Price  | Year Purchased       | Estimated or Actual Annual Repair Cost |
| <input type="text"/>  | <input type="text"/> | <input type="text"/>                   |
| Estimated or Actual Annual Usage of Equipment in Hours per Year |                      |  |
| <input type="text"/>  |                      |  |

**Additional Comments**

**(Upon completion, please submit to the appropriate District Office)**

**ATTACHMENT 5****Blue Book Supplemental Information**

After discussions with the staff at Equipment Watch, the following guidelines have been prepared to provide additional assistance with using the Blue Book for force account billings: If a particular equipment category, make, and model number is known, rather than using all of the information to drill down through the categories, simply type in the model number in the search feature and click on search. The categories assigned by Blue Book are sometimes difficult to determine.

Contractors are to be paid the FHWA Hourly Rate. When the rate is not given, it can be calculated as follows:

The FHWA Hourly Rate = [(monthly rate/176) x (model year adj.) x (Illinois adj.)] + EOC

Where: EOC = Estimated Operating Costs per hour (from the Blue Book)

Authorized idle (standby) time payment will be made at the following hourly rate:

0.5 x (FHWA hourly rate - EOC).

Equipment Watch updates the Rental Rate Blue Book twice per year, once in January, and once in July. Only half of the Book is updated each period, so in effect, a particular equipment rate stays valid for one year. All reports list the revision date for each rate (1st Half 2021, 2nd Half 2021, etc.), so it can be traced back to the proper time period for auditing purposes should it become an issue.

The Blue Book is a guide and if there are any units which a contractor feels is not represented in the guide, Equipment Watch will determine a custom rate based on the contractor completing a survey. When using a custom rate, check to ensure the "Illinois" and "Model Year" adjustments have been properly applied.

The "Model Year" adjustment is not available for pieces of equipment that are more than 20 years old. There are contractors that have older pieces of equipment. Most state DOT's accept the rate adjusted to the earliest published year, and IDOT has decided to accept this methodology as well. There are many ways to justify this treatment. Equipment Watch feels that large capital investments for major rebuilds must be made, in order to extend the economic life of these older pieces of equipment; additionally the operating cost may be higher. Thus you get a smaller ownership cost and a larger operating cost. Both of these factors tend to extend the validity of the published Blue Book rate.

For older pieces of equipment, greater than 20 years, that have a discontinued model number, most states use rates for the closest model (horsepower, capacity, etc.) published. IDOT has decided to adopt this practice. If a close match cannot be located, Equipment Watch can be contacted for a custom rate.

For new models of existing equipment that won't be incorporated into the Blue Book until the latest update, other states accept the closest model year published. IDOT has accepted this practice. Equipment Watch feels that they are equitable on their rates, and in the case of a

truck, for example, contractors will find that the acquisition cost of their trucks regardless of the GVW, is usually covered by the closest published model.

Until more Material Transfer Devices (MTD's) are incorporated into the Blue Book, custom rates may need to be requested. Several MTDs are located under the category "Asphalt Pick-Up Machines". Equipment Watch will be continuing to add more makes and models into future updates of the Blue Book.

The main purpose of the Buckets section is to allow for attachments. The best example is a hydraulic breaker for an excavator. The rate for the unit is determined by subtracting the rate for the standard bucket (or closest listed) from that of the Excavator (which includes the bucket) and adding in the rate for the appropriate hammer.

Most states avoid allowing rate changes for daily or hourly bucket changes, because it is not only an administrative nightmare but it brings the whole standby rate question to bear. The duty of the buckets (general purpose, heavy duty or severe duty) is a reflection of manufacturer nomenclature and not discrete wall thickness ranges. Model year of a bucket may be impossible to determine. Therefore, when determining a rate for equipment with bucket attachments, use the rate given for the manufacturer's standard size bucket and the same model as the equipment.

Changeable Message Signs – Although the rates for Changeable Message Signs are now being provided by Blue Book, the maximum number of hours per month remains 176. This is consistent with our previous policy when the Schedule of Average Annual Equipment Ownership Expense guide was used for equipment rates.

Due to the variability in equipment rates provided by Equipment Watch for the same piece of equipment based solely on differing annual usage hours per year provided by the contractor, when requesting a "custom" rate from Equipment Watch for a piece of equipment not available in the Rental Rate Blue Book, request "standard annual usage hours". Widely variable annual usage hours provided by the contractor greater than 2080 hours or less than 176 hours tend to create anomalies with Blue Book methodology and can significantly impact a given equipment rate. Standard annual usage hours are typically 800 to 1500 hours per year depending on the type of equipment in question. If Equipment Watch catches reported annual usage hours on a custom rate request that are out of the range of normal equipment use, they may question the requesting party.

Pile leads are listed under Pile Drivers, and one needs to "build" the required length of the lead based on dimensions and section type (top, mid, swivel, etc.) to get to the required length for either the fixed or swinging type leads. The fixed leads are listed in increments from 10 to 40ft.; the swinging leads are listed in increments of 5 to 40ft.

Because of the many variations on the cabs, conventional, crew, extended, extra-cab, etc., and the different doors, half doors, full rear seats, fold down rear seats, when Equipment Watch does their averaging, they include as "crew cab" any of the crew/extended cab/rear seating options. In other words, if it's larger than a "conventional cab" then it would be included in the "crew cab" averages.

Equipment Watch publishes rates for some equipment in the Shop Tools, Miscellaneous, and Air tools sections that are based on list prices less than \$1000. We are continuing the policy of



not giving equipment rates for small tools with a replacement value of under \$1000. Therefore no payment will be made for their use on the work.

Some listings in the Blue Book give different rates for ROPS and EROPS versions of the equipment. ROPS/ OROPS- "Roll Over Protective System", "Rollover Protective Structures" or "Open Roll Over Protective System" are different than EROPS- "**Enclosed** Roll Over Protective Structure". ROPS is a cab or frame that provides a safe environment for the tractor operator in the event of a rollover. The ROPS frame must pass a series of static and dynamic crush tests. These tests examine the ability of the ROPS to withstand various loads to see if the protective zone around the operator station remains intact in an overturn. A homemade bar attached to the tractor axle, or simple sun shades, cannot protect the operator if the tractor overturns. The ROPS must meet standards, such as those set forth by the American Society of Agricultural Engineers, which certify they provide adequate protection in a tractor upset. If the ROPS is certified, there will be a certification label on the unit.

**Prior Approval Authorization of Contract Change**

E-mail

Reset Form

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| Contract Number      | District             | Letting Date         | Route                | County               |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

|                      |                      |                      |
|----------------------|----------------------|----------------------|
| Project Number       | Job Number           | Section Number       |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

Please attach a copy of this approved form to the BC 22, Authorization of Contract Change, submitted for this work.

|                      |                        |                                      |  |
|----------------------|------------------------|--------------------------------------|--|
| Authorization Number | Awarded Contract Value | Estimated Cost of this Authorization | FHWA Approval Required? <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <input type="text"/> | <input type="text"/>   | <input type="text"/>                 |  |

**Determination**

The undersigned determine that the change is germane to the original contract as signed, because:

- ☐ Provision for this work is included in the original contract.
- ☐ Work of this type was included in the original contract, and the additional efforts of this work are within the intent of the contract and Department policy.
- ☐ The change represents an adjustment required by the contract, based on unpredictable developments in the work.
- ☐ The change in design is necessary to fulfill the original intent of the contract.
- ☐ Other, explain

**Location and Description of Work**

**Reason**


|                      |                      |
|----------------------|----------------------|
| Prepared By          | Date                 |
| <input type="text"/> | <input type="text"/> |

|                                      |
|--------------------------------------|
| Regional Engineer - Signature & Date |
| <input type="text"/>                 |

|                          |                      |
|--------------------------|----------------------|
| Engineer of Construction | Date                 |
| <input type="text"/>     | <input type="text"/> |

|  |                      |
|--|----------------------|
| Director of Highways PI/Chief Engineer | Date                 |
| <input type="text"/>                   | <input type="text"/> |

**THE STATE OF ILLINOIS  
By the Department of Transportation**

|   |                      |
|---|----------------------|
| Secretary   | Date                 |
| <input type="text"/>                                    | <input type="text"/> |
| Director of Finance & Administration                    | Date                 |
| <input type="text"/>                                    | <input type="text"/> |
| Chief Counsel   | Date                 |
| <input type="text"/>                                    | <input type="text"/> |
| Chief Procurement Officer/<br>State Procurement Officer | Date                 |
| <input type="text"/>                                    | <input type="text"/> |

**FHWA**

|                             |  |
|-----------------------------|--|
| Acceptable to Proceed?      | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Approved for Participation? | <input type="checkbox"/> Yes <input type="checkbox"/> No |

|                      |                      |
|----------------------|----------------------|
| FHWA Representative  | Date                 |
| <input type="text"/> | <input type="text"/> |

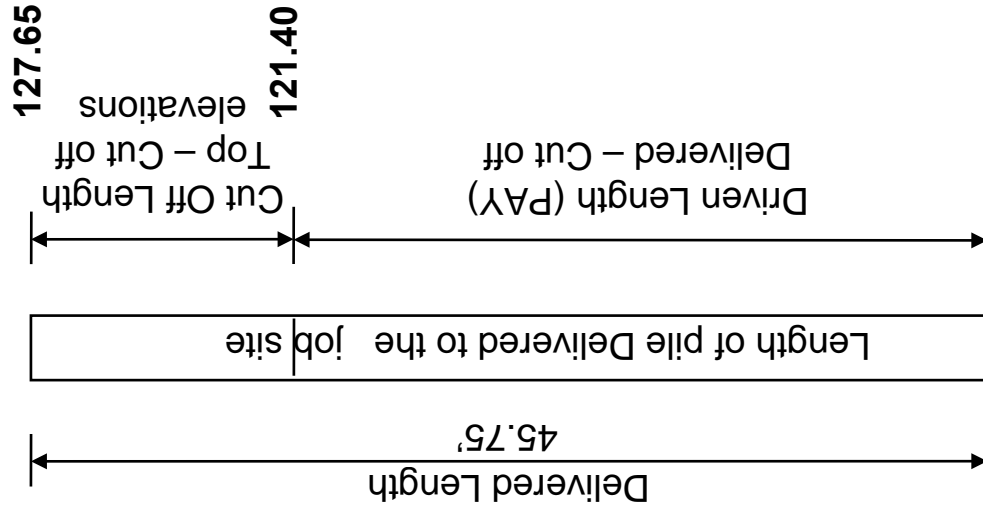
## F.U.T. / S.U.T. INFORMATION for 2025

The contractor's contribution to Federal Unemployment Insurance Tax (F.U.T.) for an employee applies only to the first \$7,000 of wages earned in a calendar year. For 2025, the rate of contribution remains at 6.0%, but employers who pay contributions on time receive a credit with the maximum credit being 5.4%; therefore, those employers contributing on time will have a Federal rate of 0.6% (6.0% - 5.4%), for a maximum FUTA tax of \$42.00 per employee, per year ( $.006 \times \$7,000 = \$42.00$ ). This information can be found on the U.S. Department of Labor, Employment & Training Administration website at <https://oui.doleta.gov/unemploy/uitaxtopic.asp>. Additional information can be located at IRS Publication 15 "(Circular E), Employer's Tax Guide" at <http://www.irs.gov/pub/irs-pdf/p15.pdf>, page 36 of 70.

Also, the contractor's contribution to State Unemployment Insurance Tax (S.U.T.) for an employee applies only to the first \$13,916 of wages earned for calendar year 2025. The rate of contribution varies for each employer. This information can be found on page 5 of the State of Illinois Department of Employment Security's [https://ides.illinois.gov/content/dam/soi/en/web/ides/ides\\_forms\\_and\\_publications/EA-50\\_2025.pdf](https://ides.illinois.gov/content/dam/soi/en/web/ides/ides_forms_and_publications/EA-50_2025.pdf). Additional information regarding this matter can be found on IDES' "Illinois Unemployment Insurance Law Handbook" at <http://www.ides.illinois.gov/IDES%20Forms%20and%20Publications/CLI106L.pdf>

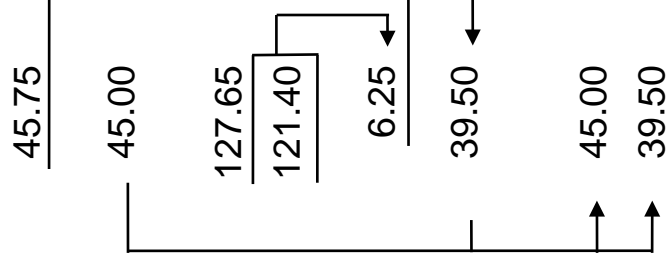
When these insurances are being charged on a force account bill, it is the contractor's responsibility to monitor and charge accordingly (see the Instructions for Preparing Force Account Bills located within Construction Memorandum No. 09). The Resident is not required to maintain a record of contractor employee's wages to determine payment on these two insurances. The contractor's billing should reflect proper charges for these insurances and the Resident has the option of having the contractor provide evidence of employee's wage earnings to verify these charges.

# Pile Payment Example



1. You Instructed the contractor to furnish 45 foot Piles
2. Measure the Length of pile Delivered
3. Determine the **Pay** Length for **Furnishing Pile**
4. Determine the Elevation of top of pile and Mark the Plan Cut off Elevation on the pile
5. Determine the Cut off
6. Determine the **Pay** Length for **Driving Pile**

**Pay Furnishing Pile**  
**Pay Driving Pile**



# BITUMINOUS MIX RECORD

(EXAMPLE ONLY)

Bit Mix No: 82BIT1234 Material Code: 19513 Name: HMA SC N50 C

| Matl Code | Material Name       | Source   | Source Name            | % Blend |
|-----------|---------------------|----------|------------------------|---------|
| 032CM16   | STONE CR CLBQ       | 51832-01 | MTRL SRV @ FRMNT       | 55.9    |
| 038FM20   | SAND ST F AGG CLBQ  | 50912-02 | VLCN MTL @ KANK        | 22.1    |
| 037FM01   | SAND NTL F AGG CLBQ | 51130-06 | SHARF @ HYWRTH         | 19.8    |
| 004MF01   | MINERAL FILLER      | 51052-04 | LVSTN ST@ OCOYA        | 2.2     |
| 10127     | AC PG 64-22         | 2260-03  | EMLSCT @ URBANA/SALINE |         |

## Mix Formula

|                 |     |                 |     |          |
|-----------------|-----|-----------------|-----|----------|
| 25 mm / 1":     |     | 1.18 mm / # 16: | 30  |          |
| 19 mm / 3/4":   |     | .600 mm / #30:  | 19  | (+/-4)   |
| 12.5 mm / 1/2": | 100 | .300 mm / #50:  | 10  |          |
| 9.5 mm / 3/8":  | 98  | .150 mm / #100: | 7   |          |
| 4.75 mm / # 4:  | 63  | .075 mm / #200: | 5.5 | (+/-1.5) |
| 2.36 mm / # 8:  | 42  | AC              | 5.8 | (+/-0.3) |

## Optimum Design Data

|          |       |
|----------|-------|
| Gmm:     | 2.453 |
| Gmb:     | 2.340 |
| % Voids: | 4.0   |
| VMA:     | 14.6  |
| VFA:     | 72.6  |
| TSR:     | 0.86  |
| Gsb:     | 2.602 |

Central Mix Design: 32BIT5678

Effective Date: 04/21/08  
I/A

Remarks:

Gmb (little d)  
from  
approved mix  
design

Aggregate Quality Reports are on file in the District Materials Office

Producer No.: 6420-05 Name: ABC ASPHALT @ Anytown, IL

Type of Plant: H&B DRUM MIXER  
Batch Size or Ton / Hr: 276 TPH  
Plant Approved: 03/19/08 Responsible Loc: 92  
Copies to:  
Res. Engr.: SMITH  
Matls Tech: EAP  
Contractor: XYZ CONSTRUCTION  
Producer: ABC ASPHALT @ Anytown, IL  
QC Mngr: B.J. JONES  
File:

County: STEPHENSON  
Section: 20RS-1&20 BR  
Route: FAP 5  
District: 2  
Cont. No.: 84776  
Job No.: C-92-072-08  
Project: STPF-BRF-  
0005/050/000  
Date: 08/17/2008

82BIT1234

|                 |                   |                     |               |
|-----------------|-------------------|---------------------|---------------|
| Contract: 76864 | State of Illinois | Resident:           | Brett Schwalb |
| County: MADISON | Department of     | Supervisor:         | John Scheibal |
| Section: 54BR-1 | Transportation    | Field Office Phone: | (618)659-9781 |
|                 | ICORS SYSTEM      | Job Number:         | C-98-032-09   |
| Route: FAP 789  | Daily Quantities  | Project:            | BRF-0789/045  |

District: 08

DQ Number: 235 Date: 09/16/2011 Contractor: C.E. Mahoney Co.

Pay Item Key: 40603315-L110L01-119I0002A-A HMA SC "C" N70

Quantity Inspected: 234.70 TON Posted  Paid on Estimate Number: 22

Estimate or Final: Final

Evidence of Inspection: Plant Report & Tickets in File & Test

Location: EB & WB 275+00 – 289+75

Source of Progress Documentation: Weight tickets on file. Yield Checks on IDR dated 9/16/2011

|           |         |                   |                     |               |
|-----------|---------|-------------------|---------------------|---------------|
| Contract: | 76864   | State of Illinois | Resident:           | Brett Schwalb |
| County:   | MADISON | Department of     | Supervisor:         | John Scheibal |
| Section:  | 54BR-1  | Transportation    | Field Office Phone: | (618)659-9781 |
| Route:    | FAP 789 |                   | Job Number:         | C-98-032-05   |
|           |         |                   | Project:            | BRF-0789/045  |

|           |    |                |
|-----------|----|----------------|
| District: | 08 | HMA SC "C" N70 |
|-----------|----|----------------|

|                |                    |                |
|----------------|--------------------|----------------|
| Qty Book Page: | 40603315-L110L01-A | HMA SC "C" N70 |
|----------------|--------------------|----------------|

|                  |          |       |         |        |   |
|------------------|----------|-------|---------|--------|---|
| Pay Item Number: | 40603315 | FASID | L110L01 | Subjob | A |
|------------------|----------|-------|---------|--------|---|

|           |            |           |
|-----------|------------|-----------|
| Units TON | Unit Price | \$83.0600 |
|-----------|------------|-----------|

|                  |         |                     |         |
|------------------|---------|---------------------|---------|
| Quantity Awarded | 229.000 | Adjusted Total Qty: | 234.700 |
|------------------|---------|---------------------|---------|

Source of Final Documentation: Weight tickets on file. Yield Checks on IDR 9/16/2011

|           |     |
|-----------|-----|
| Finalized | Yes |
|-----------|-----|

| Authorizations: |             |           |               |                |                   |
|-----------------|-------------|-----------|---------------|----------------|-------------------|
| Auth Number     | Auth Letter | CCS Code  | Date Approved | Added Quantity | Deducted Quantity |
| 5               |             | 119I0002A | 07/15/2011    | 5.700          | 0.000             |

| Quantities:                       |        |           |               |         |                                       |                                   |            |
|-----------------------------------|--------|-----------|---------------|---------|---------------------------------------|-----------------------------------|------------|
| CCS Code                          | DQ Nbr | Date      | Qty Inspected | To Date | Evidence of Inspection                | Source of Progress Documentation: | Estimate # |
| 119I0002A                         | 235    | 9/16/2011 | 234.700       | 234.700 | Plant Report & Tickets in File & Test | IDR dated 5/19/11 & tickets       | 22         |
| Location: EB & WB 275+00 – 289+75 |        |           |               |         |                                       |                                   |            |
| Estimate or Final: Final          |        |           |               |         |                                       |                                   |            |



# Illinois Department of Transportation

Office of Highways Project Implementation / Bureau of Construction  
2300 South Dirksen Parkway / Springfield, Illinois 62764

**Subject:**  
**Contract Changes**  
**Articles 104.02 and 109.04**

**CONSTRUCTION MEMORANDUM NO. 4**

**Effective: September 10, 2020**  
**Expires: Indefinitely**

This memorandum supersedes Construction Memorandum No. 7-4 dated January 23, 2017.

This memorandum provides the procedures by which highway construction contract changes will be administered, as well as the circumstances under which such changes will be permitted. These procedures are designed to ensure compliance with the letter and spirit of all applicable laws, to foster proper administration of the provisions of all Department-let highway construction contracts in accordance with accepted legal principles, and to avoid disputes that can arise when it is necessary to modify the terms of a highway construction contract. These procedures apply to all contracts that are let by the Department of Transportation. It should be noted, that for the purpose of this memorandum, the term “changes” includes change orders and adjustments.

A contract change is one of the most important aspects of contract administration. By definition, it alters the contract work from that awarded under the competitive bidding process and, therefore, requires clear explanation and careful consideration. The approval of the Regional Engineer on such an order ([BC 22](#)), Authorization of Contract Changes, signifies complete review of and support for the change proposed.

The applicable state laws are the [Illinois Procurement Code](#) (30 ILCS 500), the [State Finance Act](#) (30 ILCS 105/9.02) and the [Criminal Code](#) (720 ILCS 5/33E). The Secretary of Transportation and the Director of Highways have directed further changes in procedure both to bring the Department into conformance with the laws and to better enable the Department to administer contract changes (Departmental Order 2-2, Signature Authority).

## Basic Requirements

- All contract changes must be germane to the original contract.
- On a limited basis, Small Purchases may be approved by the Central Bureau of Construction and paid for under an existing contract.
- All extra work must be approved and directed in writing before the work begins. The method of payment should be determined prior to beginning any extra work.
- The written approval of a contract change and the written directive to the contractor may or may not be the same document. The approval or the directive can be in the form of an e-mail, Resident's memo, form [BC 2256](#) (Prior Approval Authorization of Contract Change), form BC 22 (Authorization of Contract Changes) or other written instrument (paper or electronic), as appropriate.
- The contract change must be approved by a person who has direct or delegated authority to approve the type, scope or value of the work involved in the change.



- The written approval for a contract change must include a determination that the work is germane to the contract, and the reasons for this germaneness determination.
- Ordinarily, emergency purchases / contracts are procured as outlined at <https://www.ilga.gov/commission/jcar/admincode/044/044000060C01200R.html>. However, in case of an immediate hazard to public safety, the Resident is granted limited authority to initiate work if immediate action is necessary.
- Contract changes for individual extra work efforts greater than \$100,000 must be published in the Transportation Bulletin on the Internet. An extra work effort is comprised of all the work, paid under one or more new or existing pay items, necessary to accomplish the goal of the extra work. To the extent practical, the districts are asked to submit a separate BC 22 for each extra work effort that requires publication. The Central Bureau of Construction will not try to dissect the items on the BC 22. Instead, the relevant information treated as a whole, will be published.
- Contract changes greater than \$100,000 must also be reviewed by the Procurement Policy Board (PPB). The [BC 24](#) (Request for Procurement Policy Board Waiver) is to be submitted to the Central Bureau of Construction to provide the information in the format agreed to by the PPB. Certain changes require the waiver prior to beginning the work.
- The delegated authority to approve contract changes is in relation to the entire work effort involved in the change. A work effort may involve payment under several different pay items. The delegated authority levels are for the net value of a work effort, including both additions and deductions to the various pay item quantities involved in the changed work effort.
- Residents will assign a two-digit code number to each authorization line item, to categorize the type of change involved in the line item. This requirement applies primarily to State projects. For Local Agency projects, there is a single category code (33) that is to be used for all contract changes. (See Attachments 1 & 2)

### **Change Order - Contract Adjustment**

[44 Administrative Code Part 6](#) provides the following definitions:

**Change Order** – A change in a contract term, other than as specifically provided for in the contract, which authorizes or necessitates any increase or decrease in the cost of the contract or the time for completion for procurements subject to the jurisdiction of the Chief Procurement Officers appointed pursuant to Section 10-20. (Section 1-15.12 of the Code)

**Contract Adjustment** – A written price adjustment that adds to or deducts from a contract in accordance with provisions included in the original contract, including but not limited to increases or decreases in quantities, incentives, changed conditions and the addition of missing pay items called for in the specifications.

In the past, the terms change order and authorizations have been used interchangeably. To help administer contract changes, the terms change order and contract adjustment will be used as defined above. The term authorization is used more generically to refer to all the contract changes and adjustments submitted on a

BC 22. See the Procurement Policy Board section for further discussion on Change Orders and Contract Adjustments.

### **Major and Minor Changes**

It is the policy of the Department to require the approval of the Central Bureau of Construction prior to a commitment for all major changes in the plans or contract provisions. The prior approval of the Federal Highway Administration is required for all major changes on projects that are currently considered Projects of Division Interest (PoDI) and/or Projects of Corporate Interest (PoCI).

A. Major is considered to apply to any contract change that:

1. Revises the alignment or typical section of the mainline roadway, ramps, frontage roads or crossing areas.
2. Revises the access control (either temporary or permanent).
3. Accelerates work on the project involving payment for premium time or loss of productivity (or involving other forms of acceleration e.g., winter protection of concrete) greater than \$20,000 per contract.
4. Revises the staging of construction or the traffic control plan and reduces the number of lanes open to traffic or otherwise impacts traffic flow or traffic patterns.
5. Changes the limits of the project or adds omitted work.
6. Impacts a protected environmental resource or modifies an environmental commitment such that follow-up coordination is required with the affected entities.
7. An extra work effort at contract unit prices, agreed unit prices or force account methods that equals or exceeds a total cost of \$250,000.
8. Contract Claims filed in accordance with Article 109.09. (See Construction Manual – Guidelines for Review of Contract Claims)
9. Changes the Method of Measurement or Basis of Payment for an item of work.
10. Small Purchases procured in accordance with [44 Administrative Code Part 6 Section 6.100\(b\)](#) (i.e. the Department's Procurement Rules). (Small Purchases will not require prior approval from FHWA on PoDI / PoCI projects)

B. Minor is considered to apply to any contract change that is:

1. An adjustment in unit prices, less than \$250,000, specifically required by the Standard Specifications or a Special Provision; (a traffic control price adjustment is one example).

2. An extra work effort that is to be accomplished at contract unit prices, agreed unit prices, force account or a combination thereof that does not classify as Major and will not result in a total cost equal to or exceeding \$250,000. Again, to the extent practical, the districts are asked to submit a separate BC 22 for each extra work effort. The Central Bureau of Construction will not try to dissect the items on the BC 22. Instead, the authorization's net change will be treated as a whole when classifying an authorization as a major or minor.
3. Adjusting contract quantities to final as-built quantities.
4. Acceleration of work on the project costing \$20,000 or less per contract.

### **Approval Procedures**

The Criminal Code and the Illinois Procurement Code both include provisions that require documentation of prior approval, depending on the nature and value of the change and the value of the original contract. The State Finance Act contains additional approval requirements governing higher value changes.

These provisions have created a complex web affecting the addition of work to a contract and the payment for that work. From the perspective of the contractor, proper and timely approval facilitates lawful and timely payment.

Therefore, in order to assure compliance with Illinois and Federal law, the Department's Determination to protect the public interest, and the expeditious prosecution of the work, the following requirements are established to be followed in approving all contract changes (see also Departmental Order 2-2):

1. All extra work must be approved in writing and a copy provided to the contractor before the work is begun. When the written approval is in paper form the approval must include the signature of the person who approved the change. When the written approval is electronic a written signature is not required. In addition, the person granting the approval must have direct or delegated authority to approve such a change. The written approval must also include a description and reason for the change, a statement that the change is germane and a description of why the change is germane (unless an Emergency Purchase Affidavit is filed).
2. The Resident is directly authorized to verbally or by action (i.e. layout) approve and direct additional quantities to contract pay items, when the quantities can be considered balancing. The Resident is not directly authorized to approve additional quantities if there is a significant discrepancy in the plan quantities, or the amount is greater than \$20,000.

When verbal approval is given for balancing quantity adjustments, the Resident should submit these quantities on form BC 22, Authorization of Contract Changes, in a timely basis as needed to ensure timely payment to the contractor for significant additions. The original contract documents serve as the written authorization to the contractor to proceed, so no separate written directive to the contractor is needed.

3. The Regional Engineer has the authority to approve minor changes less than \$250,000. The levels of delegated authority for minor contract changes on projects are as follows:

|                                 |           |
|---------------------------------|-----------|
| Implementation Engineer         | \$150,000 |
| Construction Engineer           | \$100,000 |
| Supervising Field Engineer      | \$40,000  |
| Resident Engineer or Technician | \$20,000  |

All delegations listed above are mandated down to the level of Residents. The Regional Engineer may delegate additional authority above these minimum levels.

For such added work, the district may proceed with the added work prior to submitting the BC 22 to the Central Bureau of Construction. However, change orders greater than \$100,000 require the Procurement Policy Board's waiver prior to work beginning (as noted later). The BC 22 will indicate that this is a minor addition. The Regional Engineer's (or their designee's) approval of the BC 22 will be accepted as approval of the work. An approved BC 22 should be submitted as soon as possible to the Central Bureau of Construction. All district approvals shall comply with the law, the contract and Department policy.

4. The Engineer of Construction is authorized to approve change orders to expedite or accelerate the construction work (Major Change) up to a value of \$250,000.
5. The Engineer of Construction is authorized to approve payment of "small purchase" work under an existing contract.
6. The Engineer of Construction is authorized to approve claim settlement offers up to a value of \$250,000.
7. In accordance with Departmental Order 2-2, Signature Authority, the Secretary must approve all changes resulting in a net addition of \$250,000 or more.

Finance Code Requirements:

In accordance with the State Finance Act and Departmental Order 2-2, when a single or cumulative contract change results in a net change that is equal to or greater than \$250,000 in a fiscal year, before funds may be obligated for such a change, the BC 22 must have the approval of the Secretary, Chief Fiscal Officer, Chief Counsel and the Chief Procurement Officer for the Department's construction and construction related procurements. (These same approvals are required for contracts having an awarded amount of less than \$250,000, if / when cumulative changes result in an adjusted contract value becoming equal to or greater than \$250,000.)

The Central Bureau of Construction will coordinate with the executive officers to obtain these approvals. It is understood that these approvals may be obtained after the work has already been ordered, when the BC 22 includes only minor changes approved at the district level. The Central Bureau of Construction will obtain these approvals, when applicable, for all major changes before the work is approved.

Coordination with FHWA:

By agreement, the Federal Highway Administration (FHWA) reviews all authorizations of contract changes on selected contracts identified as a PoDI or PoCI, and other contracts that may be required by the Oversight Agreement. Currently, the FHWA is

developing new procedures for their oversight of the Department's construction program. The FHWA is no longer identifying new contracts as a PoDI or PoCI. The FHWA last provided a PODI/POCI project list in federal Performance Year 2019 (PY 19). All contracts identified on that list shall be administered according to the following procedures. Questions about the list of active PoDI or PoCI projects can be directed to the Central Bureau of Construction.

The FHWA's prior approval is required for major changes. The FHWA's prior approval is not required for minor changes. It is recognized that some additions exceeding \$250,000 may, by their nature, not require prior approval. These additions include Balance Final Field Measurements (category code 01), Allowable Contingencies (category code 03), and Specification Performance Adjustments (category code 16) for which the work and the method of payment is included in the contract.

The district should keep the FHWA Transportation Engineers (TEs) aware of pending major changes during project visits or through telephone calls or e-mails.

Authorization Approval Process:

The Resident Engineer prepares a BC 22 and requests additional District Office review and approval. Upon obtaining the District approval, the District submits the BC 22 to the Central Bureau of Construction for additional approvals (if applicable) and processing. When central office or FHWA approvals are required, the Central Bureau of Construction will coordinate obtaining these approvals. When FHWA approval is required, the FHWA TE will notify the Central Bureau of Construction in writing (paper or electronic) whether or not the change is approved for federal participation.

Prior Approval Process:

For work efforts requiring central office or FHWA prior approval, the Resident Engineer prepares a BC 22 (or BC 2256) and requests additional District Office review and approval. Upon obtaining the District approval, the District submits the BC 22 (or BC 2256) to the Central Bureau of Construction for additional approvals and processing. The Central Bureau of Construction will coordinate obtaining these approvals. The Central Bureau of Construction will notify the District when the needed approvals are obtained so that the added work may proceed. The required FHWA prior approvals must be in writing (paper or electronic) and included on or attached to the BC 22 (or BC 2256).

The BC 2256 is primarily intended for use when prior approval is required but insufficient time exists to fully prepare a BC 22 before starting the approval process. If a BC 2256 is used to obtain the prior approval. A BC 22 must still be submitted as soon as practicable. The approved BC 2256 must accompany the BC 22 for processing as per the approval process described above.

**Local Agency Contracts Awarded by the Department**

The laws noted above apply to State-let local agency projects as well as State contracts. Residents on local agency projects must coordinate carefully with the districts to ensure that any changes made to a contract are within the limits prescribed by the laws. Delegation of approval authority will be discussed with the local agency Resident at the preconstruction conference.

Failure to follow the procedures in this memorandum could result in the loss of State or Federal-Aid participation in the cost of the project.

The district will obtain the local agency's approval of major changes and added work prior to approving a BC 22. This will afford the local agency the opportunity to determine that the necessary funding is available and that the completed project will be acceptable for maintenance.

### **Environmental Commitments**

When a change on any project, regardless of project funding or highway system, modifies an environmental commitment or permit requirement, it will be necessary to have the District Environmental Coordinator, and the central Bureau of Design and Environment as appropriate, reevaluate the continuing validity of the environmental document. The reevaluation shall be coordinated, as necessary, with affected agencies to determine the acceptability of the proposed change and the need for mitigation, prior to implementing the change. When the reevaluation indicates a change in the impacts evaluated in an approved federal environmental document, prior approval of the Federal Highway Administration (FHWA) will also be required. Changes to permit requirements will be coordinated with the permitting agency.

### **Transportation Bulletin**

The Procurement Code and the rules promulgated under this Code require that all contract changes for which the value of the extra work effort is greater than \$100,000 must be published in the Department's volume of the Illinois Procurement Bulletin. IDOT's volume is called the Notice of Contract Awards Transportation Bulletin. For germane contract changes, the publication of this information will be coordinated by the Central Bureau of Construction. However, in order to comply with the disclosure requirements and time limits of the law it is essential that the districts submit all the necessary information with the authorization in a timely manner.

The Central Bureau of Construction will submit for publication the following information from an authorization:

- Contract Number
- Project description. The description will be the one published in the Transportation Bulletin and will be obtained from the Bureau of Design & Environment after the contract is let.
- The name of the prime contractor.
- Description and reason for the change. This will be copied in its entirety directly from the BC 22 submitted by the district.
- Net Change shown on the BC 22.
- Determination statement that the change is germane, and the reason why it is germane. This will be copied from the BC 22 submitted by the district.

### Procurement Policy Board

On July 30, 2004 legislation was enacted establishing the Procurement Policy Board (PPB). One of the functions of the PPB is to provide oversight of the procurement of construction activities. As a result, all Authorizations resulting in an increase to the contract greater than \$100,000 require the review and waiver from the PPB. The BC 24 (Request for Procurement Policy Board Waiver) is to be submitted to the Central Bureau of Construction to provide the information in the format agreed to by the PPB.

Change Orders require a waiver prior to beginning the work. Change Orders include plan omissions, design changes, acceleration and other germane additions for which no provision is included in the original contract. (Category Codes 9, 19, 28 and 30)

Contract Adjustments do not require a waiver prior to beginning the work. Contract Adjustments, which would include balancing, incentives and other additions for which both the work and the method of payment are included in the contract as well as additions for missing pay items where the work was included in the plans, plan errors, plan quantity errors and differing sight conditions. (Category Codes 1, 3, 12, 16, 22, 24, 26, 29, and 85)

Authorizations resulting in a net change of \$100,000 or less, regardless of Category Code are not required to be submitted to the PPB.

Authorizations with the Category Codes 33 may or may not be considered Change Orders. These Authorizations should be examined on a case by case basis.

On Local Agency projects, Category Code 33, the Local Agency will be responsible for making the determination of a Change Order. If the determination is not readily apparent, consult the District Office or Central Bureau of Construction.

When determination is made that an Authorization (BC 22) or Prior Approval (BC 2256) will be in excess of \$100,000, the Resident Engineer, District Office, or Local Agency will submit the BC 24 to the Central Bureau of Construction. CMMS and ICORS users can transmit the information electronically. For non-CMMS / non-ICORS contracts, the BC 24 form can be emailed to [DOT.PPBW@illinois.gov](mailto:DOT.PPBW@illinois.gov) or faxed to 217-524-4922.

The information will be published in the Transportation Bulletin and then reviewed by the PPB. See <http://apps.dot.illinois.gov/changeorder/> for the PPB waiver status. A copy of the waiver documentation should be retained in the Resident's file.

Additionally, notification of a waiver may be sent by e-mail to select District personnel. The Districts are responsible for supplying a list of e-mail recipients to the Central Bureau of Construction and keeping the list current.

The process for approving Authorization of Contract Changes (BC 22) or Prior Approval Authorizations (BC 2256) which are Major Changes or require central office approvals remains the same. The IDOT approval for these BC 22's (or BC 2256's) can be processed concurrently with the submittal for PPB review; however, the work for BC 22's (or BC 2256's) considered Change Orders cannot begin until the PPB has granted a waiver. For this reason, timely submission of the BC 24 is critical to minimizing delay to the contract. A copy of the submitted BC 24 should be attached to the BC 22 (or BC 2256). If a waiver is received from the PPB prior to the BC 22 (or BC 2256) being submitted to the Central Bureau of Construction, the waiver should be attached to the BC 22 (or BC 2256).

### **Contract Renewals**

For contracts containing provisions for a renewal, the following procedures apply. (Please note the terminology is “renewal” and not “extension”.)

Notify the contractor in writing of the Department’s desire to renew the contract and have the Contractor concur in writing.

Obtain the Contractor’s signature on the BC100 (Bureau of Construction Contract Renewal Form) prior to the original contract ending date and in accordance with the contract renewal special provision.

Submit the BC 24 for the PPB review. Procurement law requires the PPB waiver be requested within 10 days of the Department electing to exercise its option to renew the contract. In the Reason for Extra Work section of the BC 24 note this is a contract renewal. For example, “This is renewal 1 of 1 as provided for in the contract.”

Submit the BC 100, BC 22, and PPB waiver to the Central Bureau of Construction. The Central Bureau of Construction will obtain the required central office approvals, submit the package to the Comptroller, and inform the District when required approvals have been granted.

### **Submittal of BC 22 - Authorization of Contract Changes**

All contract pay item quantity changes must be submitted to the Central Bureau of Construction on form BC 22, Authorization of Contract Changes. The submittal should include Regional Engineer’s (or their designee’s) approval.

The guidelines for including line item changes on an authorization (BC 22) are as follows:

- To the extent practical, submit a separate BC 22 for each extra work effort. This is primarily important for major changes or when the value of the extra work effort exceeds \$100,000, or has some possibility of exceeding \$100,000 on future authorizations.

If subsequent authorizations (BC 22’s) are needed to adjust the quantities involved in the extra work effort, those authorizations should use the same Authorization Number as the original and assign a sequential Authorization Letter to the subsequent authorizations. For example, if the items related to the original authorization are submitted on Authorization Number 22, then later authorizations for the same change order should be numbered and lettered as 22A, 22B, etc. The explanation on these subsequent authorizations will include the cumulative total of this work effort. (Note that subsequent line items used to balance previously submitted force account or agreed unit price extra work pay items should be designated with the same category code as the original submittal of the line items.)

- Small Purchases to be paid under an existing contract are to be submitted on a separate BC 22, since the determination statement will be different from ordinary, germane contract changes.
- Contract changes which represent balancing of quantities can be submitted together on a single authorization. The description of the changes can be, simply, “Balancing final quantities.”



- New pay items for force accounts or agreed unit prices representing individual work efforts (not part of another work effort) can be submitted together, or included on a balancing authorization. If it is known that the total value of the work represented by each item is less than \$100,000, and the net value of the BC 22 is less than \$100,000.

Both the Procurement Code and the Finance Code forbid line item changes to be artificially divided among separate authorizations so as to avoid any of the requirements of the laws.

### **Documentation**

#### Written Direction vs. Written Approval:

As stated in Article 109.04, Payment for Extra Work, all extra work must be directed in writing to the contractor. However, the written directive to the contractor to proceed with the extra work may or may not be the same document as the written approval of the extra work. For example, approval of the work may be documented on form BC 22, but the directive to the contractor may be accomplished by an e-mail from the Resident.

The BC 22 may be used as both the written approval of the work and the written directive to proceed only when it has been fully approved before the work is to be started. Do not forward a copy of the BC 22 to the contractor unless it includes the approval of a person with sufficient authority to approve the change.

For minor changes, the BC 22 may be considered the written approval when it is approved by, or for, the Regional Engineer, as long as this approval occurs before the contractor is directed to perform the work. In this case, the district may use some other form to direct the contractor to proceed with the work.

To avoid ambiguities that could result in contract disputes, the written directive to the contractor must provide a clear description of the work to be performed, including any reference to any applicable specifications by which the work is expected to be performed. The method of payment should also be determined at that time.

#### Description and Reason for the Change:

There must be an explanation for each item, or group of items, which someone not familiar with the project can understand. Brief explanations such as "balancing" and "change of fund key" are acceptable. If extra work is directed by a member of the district staff, the individual's name and title should be included with the explanation. For example, "Supervising Field Engineer Bill Smith directed that the culvert under the field entrance left of Station 09 + 010 be lowered to prevent the ponding of water in the ditch."

On subsequent BC 22's for an extra work effort (e.g. #11A, 11B, etc.), the description and reason will be repeated on each authorization.

Keep in mind that for authorizations to be published in the Transportation Procurement Bulletin, the description and reason will be published but not the actual line items. Make sure the written description is understandable when read separate from the actual BC 22.

Determination Statement:

A determination statement must be included on all documents approving extra work efforts. The determination statement must also be included on the BC 22 (whether or not a separate document was used to document approval of the work).

For germane (ordinary) contract changes, the determination must state that the change is germane, and explain why the change is germane.

The portion of the determination statement that is required by the Criminal Code for germane changes is: "The undersigned determine that the change is germane to the original contract as signed."

The Procurement Code goes a step further and requires that under certain conditions a determination be made as to why the change is germane. The following typical germaneness determinations can be used, when appropriate. However, actual circumstances may require greater detail.

1. The undersigned determine that the change is germane to the original contract as signed, because provision for this work is included in the original contract.
2. The undersigned determine that the change is germane to the original contract as signed, because work of this type was included in the original contract, and the additional efforts of this work are within the intent of the contract and Department policy.
3. The undersigned determine that the change is germane to the original contract as signed, because the change represents an adjustment required by the contract, based on unpredictable developments in the work.
4. The undersigned determine that the change is germane to the original contract as signed, because the change in design is necessary to fulfill the original intent of the contract.
5. The undersigned determine that the change is germane to the original contract as signed. See attached sheet for additional explanation of germaneness.

For Small Purchases paid under an existing contract, the following determination statement is to be used:

6. Small Purchase procured in accordance with Section 6.100(b) of the Department Procurement Rules. The undersigned determine that this change is in the best interest of the State and is authorized by law.

The germaneness determination specified for a contract change should be consistent between the BC 24 (when required), the BC 2256 (when used), the initial BC 22, and subsequent BC 22's (when applicable).

It is not permissible to simply place a germaneness code (e.g. G1, G2, etc.) on the BC 22. A determination statement must be used.

Miscellaneous BC 22 Documentation:

The following miscellaneous information must be noted on the BC 22 submitted to the central office:

- Type of Authorization: Contract Adjustment, Change Order.

- Major vs. Minor: Indicate whether the contract changes included on the BC 22 represent a major or a minor change.
- FHWA Oversight: On Federal-aid projects, indicate if the project is classified as a PoDI / PoCI.
- Project Location: This is intended to be a brief description of the entire project, for the benefit of the reader unfamiliar with the project. Specific location descriptions related to the included contract changes will be included with the Reason and Description, as appropriate.
- Resident/Supervisor: The name of the Resident and the IDOT Supervising Field Engineer should be noted. Typically, both individuals should approve the authorization.
- Designer: It should be noted whether the plans related to the changes included were prepared by the Department ("In House") or by a consultant. If prepared by a consultant, then the name of the consultant will also be noted.

Supporting Documentation:

When additional documentation is required to support a contract change, it should be submitted with the BC 22. The documents should reference the specific contract change by including the contract number and the authorization number on each document.

Errors and Omissions:

If the contract plans were prepared by a consultant and the contract change is categorized as an error or omission, a copy of the Errors and Omissions memo from the District Bureau of Project Implementation to the District Bureau of Program Development must be included with the authorization. Refer to [Chapter 8, Section 8-4.01, Damage Due to Consultant Errors and/or Omissions, of the Design and Environment Manual](#) for proper documentation procedures of contract changes caused by an error or omission.

Agreed Unit Prices:

Agreed unit prices require the District Estimator's review and written approval. An authorization that contains agreed unit prices will have the District Estimator's written approval or comments attached.

The contractor's written request for an Agreed Unit Price (AUP) must contain a written description of the work, quantity, and price. In order to expedite the review of an AUP request by the District Estimator, if higher than historical bid prices for a given type of work effort are requested by the contractor, justification for the higher costs (e.g., lower production rates due to confined areas, small quantities which may have higher unit prices, limited availability of material, etc.) should be clearly documented and provided in the contractor's request. Other justification that would assist the District Estimator in evaluating requests could also include documented material costs such as actual price quotes from a material supplier, a contractor's unit cost worksheet, associated mobilization costs, an "estimated" force account bill, documented production rates for the type of work specified, or any other non-typical situation which would substantiate the higher costs.

The District Estimator must document whether the approval was based on an estimates worksheet, historical bid prices, concurrent similar projects or some other basis in

accordance with the Bureau of Design and Environment guidelines. A copy of the documentation should be submitted with the authorization.

FAS ID's and CCS Codes (a.k.a. Fund Keys):

State and federal accounting procedures require that all contract changes be posted to the correct FAS ID (Fund-Area-System) and CCS Code (County-Construction Type-Safety Type). (The FAS ID / CCS Code combination is known as a Fund Key in CMMS). The FAS ID and CCS Code of each line item must be identified. All changes for the same combination of FAS ID and CCS Code must be grouped together on the BC 22. If CMMS is used to create the BC 22, this grouping is performed automatically.

Eligibility of Roadway Maintenance Work for Federal Funding:

The broad category of work called Roadway Maintenance has, in the past, included various sub-categories of work, some eligible for federal funding and some not eligible for federal funding. The following presents a breakdown of what types of roadway maintenance work are eligible for federal funding and what types are not eligible for federal funding:

A. Types of Roadway Maintenance Work that are Eligible for Federal Funding:

- Patching, overlays, and repairs of roadway to accommodate staged traffic configuration;
- Placement, repairs and maintenance of permanent guardrail damaged within construction zones when the temporary lane configurations expose the guardrail to increased risk of damage (e.g., traffic staged closer to guardrail or other safety appurtenance than will be in final configuration) and no accident report exists allowing the Department to recover costs through the Motorist Caused Highway Damage (MCHD) program (presuming every effort has been made to pursue reimbursement for any damage to guardrail from parties responsible for the damage).

B. Types of Roadway Maintenance Work that are normally not Eligible for Federal Funding:

- Permanent Safety Appurtenances (Guardrail, drums, attenuators, signs, etc.) damaged when traffic configuration and appurtenance are in their permanent configuration whether before, during or after project construction activities;
- Culvert cleaning;
- Snow plowing;
- Mowing;

Work that is eligible for federal funding and work that is not eligible for federal funding are to be broken out into separate authorizations. Work efforts not eligible for federal funding/participation under the descriptions above are to be separated into 07A fund keys. The description of work included on an authorization for work associated with roadway maintenance should be detailed sufficiently to clearly specify which type of roadway maintenance work is being performed in order to assure eligibility for federal funding.

Force Account:

When balancing force account work a recap should be provided as shown below:

|   |          |                  |
|---|----------|------------------|
| Authorization #11                       | Estimate | \$20,000.00      |
| Authorization #11A                      | Estimate | <u>32,000.00</u> |
| Total                                   |          | \$52,000.00      |
| Actual Billing                          |          | \$51,959.03      |
| Total Deduction this Authorization #11B |          | (\$40.97)        |

Force account billings and daily reports are not to be submitted with the authorization and will be retained in the district's files.

New Pay Items and Special Item Numbers:

When new pay items are added to the contract, the districts will use the following format for creating the pay item number:

- For force accounts, the first three characters of the number should be "FRC". The second three digits will correspond to the authorization number on which the item was first submitted. The last two digits will normally be "00", but if more than one new pay item is submitted on the same authorization, then change the last two digits (e.g. "0A", "0B", etc., or "01", "02", etc.) to distinguish the additional items.
- The unit of measure for force account items is DOLLAR (\$), and the unit price is \$1.00. The value of the force account is given in the quantity of the force account pay item.
- For agreed unit price items, the first two characters should be "X9" and the third character will be the district number. The remaining characters should follow the same scheme as described above for new force account items.

For example, the pay item number "FRC01000" identifies a force account that was first submitted on authorization number 10. "X9100401" identifies a new agreed unit price item from District 1 that was the second new agreed unit price pay item number submitted on authorization number 4.

In addition, the Department is tracking historical data on certain pay items that may be added to contracts. A list of these Special Pay Item Numbers is included at the end of this memorandum (see Attachment 3). If any of these types of work are added to a contract, the Resident will use the appropriate special pay item number from this list.

The list is organized by change category, to show which change category should be indicated when the item is added to the contract. Note that some of the special pay items are rarely used anymore, but are maintained in the list for historical reasons.

All the special item numbers begin with "XXX". If the same special item number is needed more than once on a contract, the last two digits of the item number can be changed for the additional occurrences, such as "0A", "0B", etc., or "01", "02".

Handwritten Copies:

On projects where IT resources are not available, Residents should hand write, in ink, a legible [BC 22](#), and submit it to the district office for typing. The [BC 22](#) submitted to the Central Bureau of Construction must be typed.

A handwritten signature in black ink that reads "Tim Kell". The signature is written in a cursive, slightly slanted style.

Tim Kell, P.E.  
Engineer of Construction

## Authorization Chart

| Code | New Category                         | Authorization Type | BC 24 Prior Approval | Germane Reason* |
|------|--------------------------------------|--------------------|----------------------|-----------------|
| 01   | Balance Final Field Measurements     | Adjustment         | No                   | 1               |
| 03   | Allowable Contingencies              | Adjustment         | No                   | 1               |
| 09   | Design Change                        | Change Order       | Yes                  | 4               |
| 12   | Utility Cause Change/Addition        | Adjustment         | No                   | 3               |
| 16   | Specification Performance Adjustment | Adjustment         | No                   | 1               |
| 19   | Contract Acceleration                | Change Order       | Yes                  | 2               |
| 22   | Differing Site Condition             | Adjustment         | No                   | 3               |
| 24   | Contract Administration              | Adjustment         | No                   | 1               |
| 26   | Highway Plan Quant Omission or Error | Adjustment         | No                   | 1               |
| 28   | Highway Design Engineering Error     | Change Order       | Yes                  | 4               |
| 29   | Bridge Plan Error or Omission        | Adjustment         | No                   | 1 or 4          |
| 30   | Construction Engineering Error       | Change Order       | Yes                  | 5               |
| 33   | Local Agency Project                 | ***                | ***                  | **              |
| 85   | Miscellaneous                        | Adjustment         | No                   | **              |

**Authorizations \$100,000 or Less, Regardless of Type, Do Not Require a BC 24**  
**All Authorizations > \$100,000, Regardless of Type, require a BC 24**

- \* Most common reason. Could vary based on individual circumstances.
- \*\* Could be any of the 5 reasons
- \*\*\* Could be either

## Change Category Descriptions

| Code      | Category   |
|-----------|--|
| <b>01</b> | <b>Balance Final Field Measurements</b> <p>Changes needed to account for the difference between estimated plan quantities and final, as-built quantities, when the work is built to the lines and grades shown on the plans. The Resident should use reasonable judgment whether an adjustment is within the expected tolerance for the accuracy of plan quantities.</p> <p>This category also includes bookkeeping changes and maximum payment adjustments.</p> <p>Note that this category does not include balancing changes for extra work items or quantities since the total cost of the extra work effort should be designated under the same, appropriate category code.</p> <p>Changes in this category are always considered germane since they are a specified adjustment of pay quantities to perform the specified work. Contract changes of this type do not require additional written direction to the contractor prior to the start of the work.</p>   |
| <b>03</b> | <b>Allowable Contingencies</b> <p>These are “built-in” changes that are required by the specifications or state-wide changes in department policy based on the type of work involved in the contract or conditions found at the job site. Generally, changes in this category are work efforts called for in the contract but specified to be paid for as extra work, or they are planned contingencies, that is, work efforts that depend on the actual field conditions which could not be known at the time of design.</p> <p>Examples include accident cleanup, anti-strip additive, repairing water main breaks, water main or service breaks, temporary drainage facilities, mowing prior to final inspection, additional cofferdams, cofferdam inspection, cofferdam excavation, storage of structural steel, pile splices, replacing damaged pipe, repairing state-owned traffic signal control equipment, additional flaggers or traffic control devices, replacing temporary striping, repair traffic barrier terminals or sand impact attenuators, railroad flaggers, pavement cleaning, temporary access, blading earth shoulders (adjacent to resurfacing), preparing or repairing existing base, covering CRCP patches, preservation of stone markers and survey monuments, installation and electricity charges for traffic signal and lighting service installations, repairing slope failures, excess field office telephone charges, samples for destructive testing, additional erosion control devices, traffic control price adjustments, investigation and cleanup of hazardous or controlled waste, and adjustments in contract unit prices as provided in the contract.</p> <p>Changes in this category are most always germane to the contract, since provision for the work is included in the specifications. Germaneness of this type of change would be questionable, though, if the cost of the change was grossly disproportionate to the value of the original contract.</p> |
| <b>09</b> | <b>Design Change</b> <p>This category includes all changes in the specifications or design that are not specified in another category without regard as to why they were initiated or who initiated them. Care must be taken to determine the germaneness of any design change.</p>  |
| <b>12</b> | <b>Utility Caused Change/Addition</b> <p>Compensation to the contractor for compensable delay damages caused by utilities, locating utilities, as well as changes in the design made primarily to accommodate or avoid utilities within the right-of-way.</p> <p>Note that this category does not necessarily include miscellaneous bills paid in accordance with Article 109.05. Such bills should be included under category 03, if more appropriate.</p>  |



Contract changes in this category are considered germane contract adjustments, insofar as the changes are provided for in the contract.

## **16 Specification Performance Adjustment**

This category includes adjustments or credits to the contract as result of deficient work or materials accepted by the Department, assessment of liquidated damages, incentive/disincentive adjustments, thickness and smoothness adjustments, traffic control deficiency deductions and erosion control deficiency deductions.

Note that most of these types of adjustments have special pay item codes (XXX\_\_\_\_) associated with them.

These adjustments are specifically provided for in the contract and are, therefore, considered germane contract adjustments. Since these adjustments must occur after the work is performed, the requirement for prior written approval does not apply to this type of change.

## **19 Contract Acceleration**

Adjustments made to the contract for the purpose of accelerating the contractor's progress in the work. Examples include pay for Premium Time, High-Early Cement, and Wintertime Concrete Protection.

## **22 Differing Site Condition**

Compensation to the contractor for additional costs incurred when subsurface or latent physical conditions are encountered in the project, in accordance with Art. 104.03.

## **24 Contract Administration**

Any costs added to the contract as a direct result of a contract claim settlement.

Note that the Contract Acceleration category should be used for an item such as Premium Time, if the acceleration item is not an explicit part of the formal claim.

All additions and deductions in pay items or quantities, including the actual value engineering incentive payment, as a result of the acceptance of a value engineering proposal from the contractor.

All other changes related to state costs for administering the contract. Examples include samples for destructive testing (such as for bearing pads), contractor furnished equipment and Partnering,

Any costs in this category that are provided for in the contract are germane contract adjustments.

## **26 Highway Plan Quantity Omission or Error**

Changes in plan quantity due to significant discrepancy between plan quantity and the as-built quantity with no change in the intended scope of work shown on the plans, as well as changes for a pay item that was not include in the plans, but for which the work was called for in the plans with the intention of paying for such work as a separate pay item. This category does not include errors in bridge plans.

Design errors in this category are not a change to the intended design but include costs that, had the error not been made, would have been included in the awarded contract amount.

Changes due to account for plan quantity errors are generally considered germane contract adjustments, unless the error is so large that the additional quantity changes the nature of the work or could be considered under a separate contract.

**28 Highway Design Engineering Error**

Changes in pay items or quantities resulting from an inappropriate design, given field conditions that were known or should have been known at the time the plans were being prepared. This category may include resolution of commitments made during the planning and design of the project, if the resolution was not adequately addressed in the plans. This category does not include errors in bridge plans.

Design errors in this category involve costs that should not have been paid had the original plans been correctly designed.

Changes due to design errors require special consideration, as some design errors changes could change the scope of the contract and would not, therefore, be considered germane.

**29 Bridge Plan Error or Omission**

Any changes resulting from an error in the bridge plans.

Note that a change is categorized as an error only if the issue involving the change was something that the designer should have known about, was within the scope of the design, and should have addressed in the plans. This category does not include errors or omissions in the highway plans.

Changes due to design errors require special consideration, as some design errors changes could change the scope of the contract and would not, therefore, be considered germane.

**30 Construction Engineering Error**

Additional compensation to the contractor due to errors in layout or construction within the responsibility of the department. This category includes construction errors by both in-house staff and consultant construction staff.

Work in this category is generally considered germane to the contract, since the extra cost is needed to restore the work to what was intended by the contract. This work would be considered a change order.

**33 Local Agency Project**

All changes on a local agency project can be grouped under this category. The other categories are intended to identify changes on State projects.

In regards to the germaneness or classification (contract adjustment vs. operational/non-operational change order) of the change, refer to the discussions noted under the appropriate category.

**85 Miscellaneous**

Changes not included in any other category above. (It is intended that this category be used rarely, if at all.)

### Special Pay Item Numbers

| <u>Category</u> | <u>Pay Item Nbr</u> | <u>Special Item</u>   | <u>Typical Units</u> |
|-----------------|---------------------|---|----------------------|
| 16              | XXX00100            | Failure to Open Lanes to Traffic                                | DOLLAR               |
| 03              | XXX02100            | Railroad Flaggers   | DOLLAR               |
| 03              | XXX03100            | Traffic Control Price Adjustments (per contract specifications) | EACH, L SUM, DOLLAR  |
| 03              | XXX03200            | Antistrip Additive  | DOLLAR               |
| 03              | XXX04000            | Mentor Protégé Reimbursement                                    | DOLLAR               |
| 03              | XXX05000            | CCDD Testing  | DOLLAR               |
| 03              | XXX05100            | CCDD Extra Costs  | DOLLAR               |
| 03              | XXX15000            | Pay Items Subject to RACIF                                      | DOLLAR               |
| 85              | XXX06000            | PLA Reporting   | DOLLAR               |
| 16              | XXX16000            | Traffic Control Deficiency                                      | CAL DAY              |
| 16              | XXX16100            | Credit Non-Compliant Work                                       | DOLLAR               |
| 16              | XXX16200            | Credit Non-Compliant Material                                   | DOLLAR               |
| 16              | XXX16300            | Erosion Control Deficiency                                      | CAL DAY              |
| 16              | XXX16400            | Credit Specification Non-Compliance                             | DOLLAR               |
| 16              | XXX16500            | DBE Goal Not Met  | DOLLAR               |
| 16              | XXX16700            | Idling Deficiency   | CAL DAY              |
| 16              | XXX16800            | Ultra Low Sulfur Diesel Deficiency                              | CAL DAY              |
| 16              | XXX16900            | Diesel Retrofit Deficiency                                      | CAL DAY              |
| 16              | XXX17100            | Liquidated Damages  | CAL DAY              |
| 16              | XXX18100            | Incentive Payment   | DOLLAR               |
| 16              | XXX18200            | Disincentive Deduction  | DOLLAR               |
| 16              | XXX18300            | Contract Compl Incentive  | CAL DAY              |
| 16              | XXX18400            | Contract Compl Disincentive                                     | CAL DAY              |
| 16              | XXX18500            | Lane Rental Incentive   | CAL DAY              |
| 16              | XXX18600            | Lane Rental Disincentive  | CAL DAY              |
| 19              | XXX19100            | Acceleration  | DOLLAR               |
| 16              | XXX19500            | Warranty Incentive  | DOLLAR               |
| 16              | XXX19600            | Warranty Disincentive   | DOLLAR               |
| 16              | XXX19700            | PFP Incentive   | SQ YD, SQ M, DOLLAR  |
| 16              | XXX19800            | PFP Disincentive  | SQ YD, SQ M, DOLLAR  |
| 16              | XXX19900            | PFP Resolutions Testing   | DOLLAR               |
| 16              | XXX20000            | PFP Credit Non-Compliant Material                               | DOLLAR               |
| 16              | XXX201**            | Thick Dis PCC _____   | SQ YD, SQ M          |
| 16              | XXX202**            | Thick Inc PCC _____   | SQ YD, SQ M          |
| 16              | XXX203**            | Thick Dis FD HMA _____  | SQ YD, SQ M          |
| 16              | XXX204**            | Thick Inc FD HMA _____  | SQ YD, SQ M          |
| 16              | XXX211**            | Smooth Inc PCC _____  | SQ YD, SQ M, DOLLAR  |
| 16              | XXX212**            | Smooth Dis PCC _____  | SQ YD, SQ M, DOLLAR  |
| 16              | XXX213**            | Smooth Inc FD HMA _____   | SQ YD, SQ M, DOLLAR  |
| 16              | XXX214**            | Smooth Dis FD HMA _____   | SQ YD, SQ M, DOLLAR  |
| 16              | XXX21500            | Surface Variations HMA SC 1T                                    | EACH                 |
| 16              | XXX21600            | Surface Variations HMA SC 2T                                    | EACH                 |
| 24              | XXX22000            | Utility Delays  | DOLLAR               |
| 24              | XXX22500            | Railroad Delays   | DOLLAR               |
| 24              | XXX23000            | Claim Settlement  | DOLLAR               |
| 24              | XXX24500            | Contractor Furnished Vehicles                                   | DOLLAR               |
| 24              | XXX25000            | Value Engineering Incentive                                     | DOLLAR               |
| 16              | XXX26100            | QCP Disincentive  | DOLLAR               |
| 16              | XXX26200            | Longitudinal Joint Density Deduction                            | DOLLAR               |
| 16              | XXX26300            | Dust AC Deduction   | DOLLAR               |
| 16              | XXX26400            | QCP Credit Non-Compliant Material                               | DOLLAR               |
| 03              | XXX27000            | Speed Display Trailer   | DOLLAR               |
| 03              | XXX27100            | Truck Mounted Attenuator  | DOLLAR               |
| 85              | XXX28000            | Project Shutdown Costs  | DOLLAR               |
| 03              | XXX35000            | Traf Cont Standard Adj (changes to the standard)                | DOLLAR               |
| 03              | XXX99000            | Fuel Price Adjustment Increase                                  | DOLLAR               |
| 03              | XXX99100            | Fuel Price Adjustment Decrease                                  | DOLLAR               |
| 03              | XXX99300            | Bituminous Price Adjustment Increase                            | DOLLAR               |
| 03              | XXX99400            | Bituminous Price Adjustment Decrease                            | DOLLAR               |
| 03              | XXX99500            | Addl RR Insurance Reqt  | DOLLAR               |
| 03              | XXX99600            | Steel Price Adjustment Increase                                 | DOLLAR               |
| 03              | XXX99700            | Steel Price Adjustment Decrease                                 | DOLLAR               |

\*\* For Pavement Thickness Incentive/Disincentive and Pavement Smoothness Incentive/Disincentive Items: Include the actual pay item description in the Special Item description. The description must be no longer than 22 characters and spaces; abbreviate where necessary. If more than one pay item falls within the same Special Item number, the last two digits should be changed (i.e. XXX20100, XXX20101, XXX20102). Do not delete the original pay item. The unit price for the Special Item will only reflect the incentive or disincentive.



|                      |                      |                      |
|----------------------|----------------------|----------------------|
| Contract Number      | District             | Letting Date         |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Route                | County               |                      |
| <input type="text"/> | <input type="text"/> |                      |
| Project Number       | Job Number           |                      |
| <input type="text"/> | <input type="text"/> |                      |
| Section Number       |                      |                      |
| <input type="text"/> |                      |                      |

|                      |                      |
|----------------------|----------------------|
| Date                 | Authorization Number |
| <input type="text"/> | <input type="text"/> |

Project

Description

Contractor

|                        |                      |                      |
|------------------------|----------------------|----------------------|
| Awarded Contract Value | Authorization Amount | Category Code        |
| <input type="text"/>   | <input type="text"/> | <input type="text"/> |

Reason for Extra Work

**Determination of Germaneness:**

- ☐ The undersigned determined that the change is germane to the original contract as signed, because provision for this work is included in the original contract.
- ☐ The undersigned determined that the change is germane to the original contract as signed, because work of this type was included in the original contract, and the additional efforts of this work are within the intent of the contract and Department policy.
- ☐ The undersigned determined that the change is germane to the original contract as signed, because the change represents an adjustment required by the contract, based on unpredictable developments in the work.
- ☐ The undersigned determined that the change is germane to the original contract as signed, because the change in design is necessary to fulfill the original intent of the contract.
- ☐ The undersigned determined that the change is germane to the original contract as signed, because

|                      |                      |
|----------------------|----------------------|
| Resident Signature   | Date                 |
| <input type="text"/> | <input type="text"/> |
| Resident Name        |                      |
| <input type="text"/> |                      |



|   |  |
|---|--|
| <input checked="" type="checkbox"/> Contract Adjustment | <input type="checkbox"/> PoDI/ PoCI              |
| <input type="checkbox"/> Change Order                   |  |
| <input type="checkbox"/> Consultant                     | <input type="checkbox"/> Major Change            |
| <input checked="" type="checkbox"/> InHouse             | <input checked="" type="checkbox"/> Minor Change |

**Date:** 08/07/2018  
**County:** CHAMPAIGN (019)  
**Section:** (30X-2)RS-4(31-X)RS-1  
**Route:** FAS 1522 & FAU 7092  
**District:** 05  
**Contract:** 70707  
**Job No.:** C9508807  
**Project No.:** STP-HSIP-000V(50)

Consultant's Name: N/A

Contractor: CROSS CONSTRUCTION  
Address: 3615 N COUNTRYVIEW RD  
URBANA IL 61802-

The following change from the plans in the construction of the above designated section of highway improvement is authorized and directed. The estimated quantities are shown below at the awarded contract prices except as indicated. The first addition of an item not in the original contract under the fund type or county is indicated by an asterisk.

| Item No.                                    | * | Cat | Pay Item                | Unit   | Quantity | Unit Price | A/D                   | Addition     | Deduction  |
|---|---|-----|-------------------------|--------|----------|------------|-----------------------|--------------|------------|
| FAS ID: LZ2ED01                             |   |     | CCS Code 0190005        |        |          |            |                       |              |            |
| 78300200                                    |   | 01  | RAISED REF PVT MK REM   | EACH   | 37.000   | 15.0000    | D                     | \$0.00       | \$555.00   |
| XXX03100                                    | * | 03  | TRAF CONT PR ADJ 701201 | DOLLAR | 52.630   | 1.0000     | A                     | \$52.63      | \$0.00     |
| XXX21600                                    | * | 16  | SURF VAR HMA SC 2T      | EACH   | 11.000   | -170.3000  | A                     | (\$1,873.30) | \$0.00     |
| FAS ID: M2E1U01                             |   |     | CCS Code 0190005        |        |          |            |                       |              |            |
| X9500600                                    |   | 01  | METAL POST TY B         | FOOT   | 26.000   | 30.3500    | D                     | \$0.00       | \$789.10   |
| Amount of Original Contract: \$3,949,999.99 |   |     |                         |        |          |            | Totals:               | (\$1,820.67) | \$1,344.10 |
| Net Change To Date: \$48,180.04             |   |     |                         |        |          |            | Percent Change: 1.22% | Net Change:  | -3,164.77  |

**Project Location:** US 45- RANTOUL - FORD CO

**Description and Reason:** SEE ATTACHED SHEET FOR DESCRIPTIONS, LOCATIONS AND REASONS - BALANCING AUTH

**Determination:** (G1) The undersigned determine that the change is germane to the original contract as signed, because provision for this work is included in the original contract.

THE STATE OF ILLINOIS  
By the Department of Transportation

Randall S. Blankenhorn, Secretary Date

Matt Magalis, Chief Fiscal Officer Date

Phillip C. Kaufmann, Chief Counsel Date

Date Regional Engineer

**Supervisor:** JASON R SMITH

Date Engineer of Construction

**Resident:** M GUTTERRIDGE

Date Director of Highways PI/Chief Engineer

Supervisor Date

Resident Date

FHWA Acceptable to Proceed: ☐ Yes ☐ No FHWA Participation: ☐ Yes ☐ No

**Print Date:** 08/07/2018

FHWA Representative Date  
BC22 (rev. 5/10/18)



Traffic Control  
Inspection Report

BSE 725 on File? Yes Est. Completion Date 9/15/16 County McLean District 5 Date 07/14/16 Time 9:30 AM Report No. 5  
Job C-95-024-09 Section (57-20.57-1)RS&S6RS-3 Contract 70767 FAP 730, FAP 322  
Type of Work Patching, Milling, Resurfacing, Guardrail, Striping Location US 51 / Bsn 51 from Woodrig Rd to Country Acres Rd in Bloomington  
RE/RT William Parker, Jr. Contractor Rowe Construction Company

| Traffic Control                             | Evaluate: (G) Good, (F) Fair, (D) Deficient, (X) Does Not Apply |                        |                     | Description, Comments or Corrective Measures Recommended           |
|---|---|------------------------|---------------------|--|
|   | Condition   | Location/<br>Placement | Night<br>Visibility |  |
| Signs                                       | G   | G                      | X                   | RAMP OPEN AHEAD & RAMP OPEN AHEAD SIGNS IN PLACE @ BOTH RAMPS.     |
| Sign and Device Lights                      | X   | X                      | X                   |  |
| Channelizing or Hazard Marking Devices      | G   | G                      | X                   | CONES USED. SPACINGS PROPER. NEED A CONE IN FRONT OF OPEN PATCHES. |
| Pavement Markings                           | X   | X                      | X                   |  |
| Arrow Board(s) and Changeable Message Signs | G   | G                      | X                   |  |
| Temporary Traffic Signals                   | X   | X                      | X                   |  |
| Temporary Barrier Wall                      | X   | X                      | X                   |  |
| Flagger(s)                                  | G   | G                      | X                   | FLAGGER @ MILL, FLAGGERS @ RAMPS (3)                               |
| Comments on other items:                    | Location(s): NB PL & RAMPS QUEST TO WOODRIG PD PATCHING         |                        |                     | Standard(s) 701421 Utilized: 701411                                |

Do any previously reported discrepancies still exist? ☐ Yes ☒ No If yes, describe:  
cc: ☒ File ☐ RE or RT ☐ Field Engineer Submitted by: Will. Parker  
☐ Field ☒ Operations/Traffic Engineer Reviewed by:  
☒ Contractor ☐ Subcontractor



# Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

August 7, 2018

SUBJECT: Contract No. 61E32  
Cook County  
Section 14-00028-00-SW  
Route FAU 1602  
Project BR78-203  
District 1

*If you have questions,  
contact Contracts at  
Design & Environment  
at (217) 782-7806 .*

Davis Concrete Construction Company  
11244 W. Manhattan-Monee Rd.  
Monee, IL 60449

Dear Contractor:

Approval was received on July 26, 2018 from Metra for the Railroad Protective Liability Insurance Policy No. RP008U418 you furnished in connection with the subject improvement.

The policy you furnished indicates that coverage expires April 6, 2019.

Very truly yours,

Jack A. Elston, P.E.  
Engineer of Design & Environment

By: Katharine L. Finn  
Chief Contract Official

A handwritten signature in cursive script that reads "Katharine L. Finn".

KF/jv

cc: Anthony Quigley, Region 1, District 1  
Magdalena Marinkovic, District 1  
Design Environment File  
Unit File



## 406.11 SURFACE TESTS

The Department uses a bump buggy or straightedge to check the surface smoothness of the new pavement overlay. See Figure 400-13.

**Figure 400-13 — 16-FT STRAIGHTEDGE**



## 406.14 BASIS OF PAYMENT

### 406.14-1 General (Tack Coat)

To accurately pay for tack coat material placed on the pavement surface, the quantity measured for payment will be the actual residual amount of asphalt applied. The volume of the cutback or emulsion used and any water added will not be the amount that is measured for payment. The residual amount of asphalt in the emulsion or cutback will be used for payment.

A test procedure has been developed to physically check the residual amount of asphalt applied to the pavement surface. For projects that contain at least 2000 tons (1815 metric tons) of HMA, the Inspector shall determine the residual amount of asphalt placed using the test procedure titled, "Determination of Residual Asphalt in Prime and Tack Coat Materials," which is Appendix B24 in the BMPR [Manual of Test Procedures for Materials](#). If a copy of the *Manual* is not available in the Resident's field office, a copy of the test procedure can be obtained from the BMPR or IDOT's website.

The test shall be performed at least once per project for each type of surface being tacked for which at least 2000 tons (1815 metric tons) of HMA will be placed, preferably on the first day tack coat is placed on a given surface. More tests may be performed at the Resident's discretion. The Contractor may proceed with paving as soon as the tack fully breaks and before the test results are provided. However, test results should be obtained as quickly as possible.

This test is not intended to be the sole criteria used for acceptance of the work, but it is a tool for the Resident to evaluate the Contractor's performance. The residual rate of material placed will be calculated as described below based on truck weights.

If the test results and/or quantity calculations indicate that the residual amount of tack on the surface to be paved does not meet the specified amount, the tack may be considered unacceptable. However, research has shown that tack coat applied with a tolerance of plus or minus 0.01 lb./sq. ft. is adequate. Recognizing that precisely meeting the specified rate can be difficult, engineering judgment should be used to consider if unacceptable work performed is adequate to leave in place. In accordance with Article 105.03, the Department reserves the right to accept work that is in close conformity with the contract by a contract modification. The construction supervisor and BMPR should be consulted on how to address the situation. The Contractor shall make appropriate adjustments for further applications so that the correct amount of material is placed. Payment will be made by weight as described in Section 406.14-2.

#### **406.14-2    Payment Procedures**

The Inspector will need to know the following to properly calculate the amount of material for payment:

- The total weight of the material applied (This weight includes any additional water added to the emulsion). The actual percentage of residual asphalt in the emulsion or cutback as produced
- The amount of water added to the emulsion

The pressure distributor shall be weighed before and after placement of the tack coat to determine the net amount of material placed. Any scale of adequate size and displaying a current Department of Agriculture sticker will be sufficient to perform the weighing.

The actual percentage of residual asphalt in the emulsion or cutback, as produced, will be indicated on the producer's Bill of Lading or attached Certificate of Analysis from the BMPR. The amount of additional water (if any) added to an emulsion will also be indicated on the Bill of Lading.

The amount of water added is necessary to calculate the percent of emulsion in the diluted emulsion mix. The Bill of Lading will show the amount of water that was added to a tanker of the emulsion from which the pressure distributor is loading out. For example, a pressure distributor may only have two tons of a diluted emulsion mix in its tank, but the tanker it loads out from will have much more. The amounts of emulsion and water on the Bill of Lading may far exceed the quantity delivered in a pressure distributor. Information provided in this fashion is appropriate because only the percentages of water and emulsion are necessary to calculate quantities for payment. Payment is based on weighing the amount of diluted emulsion placed from the pressure distributor.

Using the percentage of residual asphalt for the material used, the quantity of residual asphalt placed can then be calculated as shown in the following two examples.

**406.14-3    Example to Calculate Residual Amount of Asphalt from an Emulsion**

Known:    Material used is an emulsion.

Percent of residual asphalt in the emulsion = 57% (from the producer's Bill of Lading or attached Certificate of Analysis)

Weight of pressure distributor before application of material = 35,000 lb

Weight of pressure distributor after application of material = 28,000 lb

Amount of water added (from Bill of Lading) = 2208 lb added to a tanker containing 8300 lb of the emulsion

Calculate the amount of residual asphalt for payment:

Net weight of material:

$$35,000 - 28,000 = 7000 \text{ lbs.}$$

Percentage of emulsion in the pressure distributor:

$$8300 \text{ lb.} + 2208 \text{ lb.} = 10,508 \text{ lb. (total weight of diluted emulsion mix)}$$

$$8300 \text{ lb.} / 10,508 \text{ lb.} = 79\% \text{ (amount of emulsion in the pressure distributor)}$$

Percent residual asphalt for payment:

$$7000 \text{ lb.} \times 0.79 = 5530 \text{ lb. of emulsion}$$

$$5530 \text{ lb.} \times 0.57 = 3152 \text{ lb. of residual asphalt}$$

3152 lb. represents the weight of actual residual asphalt that can be paid as Tack Coat

The provisions for maximum payment will apply to this quantity. For example, assume that the quantity ordered by the Resident for tack coat is 3100 lb (based on the area to be tacked and the appropriate residual rate):

$$\text{Maximum payment} = 3100 \text{ lb.} \times 1.05 = 3255 \text{ lb.}$$

Therefore, all 3152 lb. of residual asphalt placed can be paid for.

**406.14-4    Example to Calculate Residual Amount of Asphalt from a Cut Back**

Known:    Material used is a cutback.

Percent of residual asphalt in the cutback = 60% (from the Bill of Lading or attached Certificate of Analysis)

Weight of pressure distributor before application of material = 35,000 lb.

Weight of pressure distributor after application of material = 29,750 lb.

Calculate the amount of residual asphalt for payment.

Net weight of material:

$$35,000 - 29,750 = 5250 \text{ lb.}$$

Percent residual asphalt for payment:

$$5250 \text{ lb.} \times 0.60 = 3150 \text{ lb.}$$

3150 lb. represents the weight of actual residual asphalt that can be paid as Tack Coat

The provisions for maximum payment will apply to this quantity. For example, assume that the quantity ordered by the Resident for tack coat is 3100 lb. (based on the area to be tacked and the appropriate residual rate):

$$\text{Maximum payment} = 3100 \times 1.05 = 3255 \text{ lb.}$$

The Method of Measurement for Bituminous Materials (Tack Coat) is located in Article 1032.02. The Article states that a weight ticket for each truck load shall be furnished to the Inspector. The truck referred to in this Article is the pressure distributor that is required to place the material. Tack to the project is in a large semi tanker, a tank at the Contractor's yard or from a tank at the producer's facility. Weight tickets are not needed for materials contained in these tanks. Only material that is delivered to the project in a pressure distributor requires weight tickets.

## **SECTION 407. HOT-MIX ASPHALT PAVEMENT (FULL DEPTH)**

### **407.01 DESCRIPTION**

The specifications for the construction of HMA (full depth) are essentially the same as that for the construction of binder and surface courses (see Section 406). The difference for a full-depth pavement is the construction of the pavement in multiple lifts with a maximum thickness for each lift.

Review the [Construction Inspector's Checklist for HMA Pavement \(Full Depth\)](#).

### **407.05 SUBGRADE**

Check the subgrade to ensure that it is at the proper grade and cross section. The riding quality of the new pavement will depend largely on the smoothness of the grade on which it is placed. Check the grade on subgrades by stringline from grade stakes or level shots. Many problems with thin pavements and/or rough riding pavement are due to poor grade control.

## PAYMENT CALCULATION FOR RESIDUAL AMOUNT OF ASPHALT FROM AN EMULSION

Calculations per Construction Manual

|                |                   |
|----------------|-------------------|
| CALC BY<br>DGR | 7/15/2015         |
| CKD BY<br>AOK  | DATE<br>7/15/2015 |

|                     |
|---------------------|
| CONTRACT #<br>70985 |
|---------------------|

Knowns:

|  |            |
|--|------------|
| > material used is an emulsion                                 |            |
| > % of residual asphalt in the emulsion ( from Bill of Lading) | 0.57 A     |
| > wt of distributor before application                         | LB 35000 B |
| > wt of distributor after application                          | LB 28000 C |
| > amount of water added ( from Bill of Lading)                 | LB 2208 D  |
| > added to a tanker with shown amount of emulsion              | LB 8300 E  |

### NET WEIGHT OF MATERIAL:

|  |            |
|--|------------|
| net wt of distributor before application = | LB 35000 B |
| net wt of distributor after application =  | LB 28000 C |

NET WT OF MATERIAL = (B - C) = LB 7000 F

### PERCENT OF ORIGINAL EMULSION IN DISTRIBUTOR:

TOTAL WT OF DILUTED EMULSION MIX = E + D = G LB 10508 G

AMOUNT( %) OF ORIGINAL EMULSION IN DISTRIBUTOR = E/G = H 0.790 H

### POUNDS OF RESIDUAL ASPHALT:

POUNDS OF EMULSION = F X H = I LB 5529 I

POUNDS OF RESIDUAL ASPHALT = I X A = J LB 3152 J

( represents the amt of actual asphalt that can be paid as prime coat)

|   |                   |
|---|-------------------|
| LENGTH (MEASURED)                                       | FT 5175 K         |
| WIDTH (MEASURED)  | FT 12 L           |
|   | SQ FT 62100 M     |
| rate based on area / lbs of residual asphalt<br>Z = J/M | LB/SQ FT 0.0508 Z |

SPECIFIED RATE (ENTER RATE) LB/SQ FT 0.05 N

### THEORETICAL AMOUNT OF ASPHALT = O

O = M X N LB 3105 O

MAX PAY = 105 % X O = P LB 3260 P  
(ALLOWABLE)

If Delivered Residual (J) < Max Pay (P), then Pay Delivered Residual (J)

If Delivered Residual (J) > May Pay (P), then Pay Max Pay (P)

PAY QUANTITY = 3152 LB

## VERIFICATION OF RESIDUAL ASPHALT APPLICATION RATE

CONTRACT #  
70985

PER APPENDIX B24 FROM MANUAL OF TEST  
PROCEDURES FOR MATERIALS

ONLY USE IF PROJECT HAS > 2000 TONS OF HMA

**NOTE:**

ONLY USED TO VERIFY THE RATE IS CORRECT. DO NOT USE FOR PAYMENT ADJUSTMENT

- 1) CUT 12 IN X 12 IN PIECE OF CARDBOARD; WEIGH CARDBOARD ( TO NEAREST 0.1 GRAM)
- 2 ) PLACE CARDBOARD ON PAVEMENT AHEAD OF PRIME TRUCK, AND PRIME OVER CARDBOARD
- 3) TAKE CARDBOARD + PRIME TO OVEN AND DRY AT  $230^{\circ} \pm 9^{\circ} \text{ F}$
- 4) WEIGH DRY CARDBOARD + PRIME ( TO NEAREST 0.1 GRAM)

WEIGHT OF CARDBOARD (NO PRIME) GRAMS 50.1 Q

WEIGHT OF CARDBOARD ( WITH DRY PRIME) GRAMS 73.0 R

RESIDUAL ASPHALT APPLICATION RATE=  $S = R - Q / 454 = \text{LBS/SQ FT}$   
LB/SQFT 0.0504 S

|                |                   |
|----------------|-------------------|
| CALC BY<br>DGR | DATE<br>7/15/2015 |
| CKD BY<br>AOK  | DATE<br>7/15/2015 |

Ticket Tape Calculations for Emulsions with Added Water

|   |                            |
|---|----------------------------|
| BILL OF LADING                                |                            |
| Kane Asphalt<br>136 Crane Rd.<br>Bartlett, IL | 11954                      |
| Sold to: Murphy Construction                  |                            |
| Delivered to: Schaumburg, IL                  |                            |
| Truck No: 207                                 | Driver: P. O'Hara          |
| Material: SS-1                                | Residue 57.0%              |
| Gross: 38508 lb                               |                            |
| Tare 28000 lb                                 |                            |
| Net Wt. 10,508 lb                             | 8,300 LB.-E<br>2,208 LB.-W |
| Sp. Gr 1.01.                                  |                            |

ALTERNATE METHOD

New % Residual Asphalt =

$$\frac{(\text{Wt. Emulsion}) \times (\% \text{ Residue})}{$$

$$(\text{Wt. Emulsion}) + (\text{Wt. Added Water})$$

Pounds of Residual Asphalt Applied =

$$(\text{New \% Residual Asphalt}) \times (\text{Wt. Applied})$$



$$(\text{Initial Wt.} - \text{Final Wt.})$$

New % Residual Asphalt =

$$\frac{(8,300)}{(8,300) + (2,208)} \times (0.570)$$

$$(\text{Wt. Emulsion}) \times (\% \text{ Residue})$$

$$= 0.4502$$

$$\frac{(\text{Wt. Emulsion}) + (\text{Wt. Added Water})}{$$

$$(8,300 + 2,208)$$

Pounds of Residual Asphalt Applied =

Initial Truck Wt. = 31,200 lbs

Final Truck Wt. = 21,420 lbs

$$(\text{New \% Residual Asphalt}) \times (\text{Wt. Applied})$$

$$(0.4502) \times (31,200 - 21,420) = 4,403.2 \text{ lb}$$