



# **Section A**

## GENERAL REQUIREMENTS

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 System (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](#). See the latest issue of the memo [ICORS and Acceptable Documentation](#), issued by the Engineer of Construction.

In accordance with Department Order 8-2, 5.B.4, 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 Form [BC 2331](#), ICORS PC Backup Schedule. On days do backup is required, the Resident or designated representative shall enter "No ICORS entry today" on that date in the form. This form shall be kept current and shall be subject to review upon request. Refer to the [Forms and Reports](#) section of the Construction manual for further details.

### **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 should be a bound hardback book. 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-25](#)) 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-26)

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 are:

1. Weather.
2. Progress Schedule Controlling Item of Work and actual work done by Contractor's forces during day.
3. Number of persons working.
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 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 Memorandum 60 for projects involving these measures.

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

When working day charges are not required to be documented, it is recommended that the Resident note whether the day is workable (i.e. whether work could have been performed on the controlling item). This could provide very useful information if a claim for extra time is submitted later.

## 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.

**Title Page (Form BC 623)** – Example, page F-2. 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-3. 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-4. 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. Your Implementation Support Technician has extra blank forms, which are to be used for added pay estimate line items, or if additional pages are needed for any established 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 should 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 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 and Each 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 and Lump Sum items, this area must sufficiently identify the source documents which support the final quantity for this item. This area may also be used to cross reference to other supporting documentation such as depth checks.

**Inspection Reports (Form [BC 625](#))** – Example, page [F5](#). 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 was 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 [Final Documentation](#) later in this section.

When for [BC 628](#) Inspector's Daily Report/IDR (Example, page [F-28](#)) 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 shall 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 in a binder, with pay item number and cross references clearly marked.

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 project records, the cover must also show an 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-12](#))

Use of a field book is required for:

1. Permanent survey records, layout records and cross-sections

2. PC concrete paving summary (Example, page [F-13](#)), or Form [BC 2531](#)
3. Class I or Superpave, bituminous concrete paving summary (Example, page [F-15](#)), or Form [BC 2529](#)
4. Concrete Superstructure pour summary (Example, page [F-17](#))

QC/QA projects do not eliminate the documentation requirements above for PCC and Bituminous 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", "Calc'd by" and "Checked by" are required. 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.

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, page [F-19](#)

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 (Example, page [F-19](#)), 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 acknowledgment 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 M TON (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 meters (cubic yard)

Example, pages [D-1](#), [F-28](#),

- (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 meters (cubic yard)

Example, page [F-31](#).

- (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** – kilograms (pounds)

Example, page [F-31](#).

- (1) Establish a  $\text{kg/m}^3$  ( $\text{lbs./y}^3$ ) 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** – meters (lineal feet)

Example, page [F-35](#).

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

**Lineal and Area Pay Items** – m and sq. m (lineal feet, sq. yd, and sq. ft)

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

**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-36](#)):

- 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.
- For temporary traffic signals and temporary bridge signals, pay 60% after the 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**

Since this pay item pertains to that material obtained from within the limits of the right of way and is measured in cubic meters (cubic yards) 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 [Memorandum No. 76](#), Contractor Payments), some types of work require that 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 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

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 Department
  - 1. Printout of the input data, initialed and dated by the person who checked the input;
  - 2. Hard-copy of the results.
- B. Electronic spreadsheets
  - 1. Printout of the spreadsheet. The printout must show:
    - a. pay item identification or the purpose of the calculation
    - b. the input data
    - c. description of how the results are calculated (e.g. sample formulas)
    - d. calculation results (if applicable)
    - e. cross-references to any other referenced documents
  - 2. The hard-copy of the spreadsheet must be 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)**

(See [Schedule of Average Annual Equipment Ownership Expense](#) and [Construction Memorandum No. 4](#), Contract and Force Account Change Orders.)

Agreed Unit Price Items:

To establish a new unit price item will require a copy of the letter of agreement 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.

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 days 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 the latest revision of [Schedule of Annual Equipment Ownership Expense](#) as issued by the Department.
- (d) Balancing authorization.

#### **MATERIALS ALLOWANCE**

Example, page [F-37](#) & [F-38](#). Payment may be made for materials such as 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 Memorandum No. 76](#), Contractor Payments).

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 canceled 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 (OC 803) 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-4](#). 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 percentage 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	KILOGRAM (POUND)	103%
PHOSPHORUS FERT NUTR	KILOGRAM (POUND)	103%
POTASSIUM FERT NUTR	KILOGRAM (POUND)	103%
EMULSIFIED ASPHALT	LITER (GAL or TON)	105%
AGG SHLDS (A or B)	M TON (TON)	108%
AGG SURF CSE (A or B)	M TON (TON)	108%
AGGREGATE	M TON (TON)	108%
AGG BASE CSE (A or B)	M TON (TON)	108%
AGG BASE CSE REPAIR	M TON (TON)	108%
BIT CONC BIND CSE	M TON (TON)	103%
BIT CONC SC CL I	M TON (TON)	103%
MIX FOR CR, JTS & FLGWYS	M TON (TON)	103%
LEVEL BIND (MACH & HAND)	M TON (TON)	103%
BIT MATLS PRIME CT	LITER (GAL or TON)	105%
BIT MATERIAL APPLIED	LITER (GAL or TON)	105%
BLOTTER AGGREGATE	TON (M TON)	110%
(NOT AGG PRIME COAT)		
BIT MATL (COVER & SEAL CTS)	LITER (GAL or TON)	105%
COVER COAT AGG	M TON (TON)	110%
SEAL COAT AGG	M TON (TON)	110%
BIT MATLS PUMPED	LITER (GAL)	105%
BIT MATLS (ROAD MIX or SEAL CT)	LITER (GAL or TON)	105%
BIT MIX COMPLETE	M TON (TON)	103%
GRANULAR EMBANKMENT SPECIAL	M TON (TON)	108%
POROUS GRANULAR EMBANKMENT	M TON (TON)	108%
AGRICULTURAL GROUND LIMESTONE	M TON (TON)	108%
SUBBASE GRANULAR MATL, TY	M TON (TON)	108%
TY (A, B, or C)		

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

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>
Class I or Superpave Bituminous Concrete 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

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 100 mm (4 inches) or deeper" and "all patches were 225 mm (9 inches)" are NOT acceptable. Actual measurements must be recorded.** In addition, some items such as full-depth bituminous and PCC pavement require that cores will be taken and measured by other than project personnel. This coring will be the responsibility of the District Bureau of Implementation & District Bureau of Operations (see Construction [Memorandum No. 43](#)).

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 by the Central Bureau of Construction 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 the many square meters (square foot, square yard) and lineal 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 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 CONSTRUCTION	SPEC. REFERENCE	MINIMUM FREQUENCY	DOCUMENT RECORD	METHOD OF MEAS.
<u>BASE COURSES</u>				
Agg Base Course	351.06	1 per 300 m (1000 lf)	F.B., IDR	<u>1/</u>
PCC Base Course	420.18 & C.M. 42	1 per 75 m (250 lf)	F.B., IDR *	<u>1/</u> , <u>2/</u>
PCC Base Course				
Widening (under 6')	354.09	1 per 300 m (1000 lf)	F.B., IDR *	<u>1/</u> , <u>2/</u>
Bit Base Course	355.11	1 per 75 m (250 lf)	F.B., IDR *	<u>1/</u> , <u>3/</u>
Bit Base Course				
Widening	356.07	1 per 75 m (250 lf)	F.B., IDR *	<u>1/</u> , <u>3/</u>
Soil Cement	352.16	1 per 300 m (1000 lf)	F.B., IDR	<u>1/</u>
<u>SUBBASES</u>				
Subbase Gran Matl	311.07	1 per 300 m (1000 lf)	F.B., IDR	<u>1/</u>
Bit Agg Mixture	312.36	1 per 75 m (250 lf)	F.B., IDR	<u>1/</u> , <u>10/</u>
Cement Agg Mixture	312.36	1 per 75 m (250 lf)	F.B., IDR	<u>1/</u> , <u>9/</u>
Pozzolan Agg Mixture	312.36	1 per 75 m (250 lf)	F.B., IDR	<u>1/</u> , <u>9/</u>
Cement Agg Mixture II	312.36	1 per 75 m (250 lf)	F.B., IDR	<u>1/</u> , <u>9/</u>
<u>PAVEMENTS &amp; SURFACE COURSES</u>				
Agg Surface Course	402.06	1 per 300 m (1000 lf)	F.B., IDR	<u>1/</u>
PCC Pavement	420.18 & C.M. 42	1 per 75 m (250 lf)	F.B., IDR *	<u>1/</u> , <u>4/</u>
Bit Conc Full Depth	420.18	1 per 75 m (250 lf)	F.B., IDR *	<u>1/</u> , <u>5/</u>
<u>SHOULDERS</u>				
Agg Shoulders	481.04	1 per 300 m (1000 lf)	F.B., IDR	<u>1/</u>
PCC Shoulders	483.09	1 per 75 m (250 lf)	F.B., IDR *	<u>1/</u> , <u>7/</u>
Bit Agg Mixture	482.07	1 per 300 m (1000 lf)	F.B., IDR	<u>1/</u> , <u>8/</u>
<u>PATCHING</u>				
Bituminous 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	424.11	1 per 100 m <sup>2</sup> (1000 sf)	F.B., IDR	<u>1/</u>
PCC Slopewall	511.05	1 per 100 m <sup>2</sup> (1000 sf)	F.B., IDR	<u>1/</u>
PCC Median	606.13	1 per 100 m <sup>2</sup> (1000 sf)	F.B., IDR	<u>1/</u>
PCC Curb, Gutter,				

TYPE OF CONSTRUCTION	SPEC. REFERENCE	MINIMUM FREQUENCY	DOCUMENT RECORD	METHOD OF MEAS.
Combination Curb & Gutter	606.13	1 per 75 m (250 lf)	F.B., IDR	<u>1/</u> , <u>11/</u>
PCC Paved Ditch	606.13	1 per 75 m (250 lf)	F.B., IDR	<u>1/</u>
Top Soil	211.07	1 per 75 m (250 lf)	F.B., IDR	<u>12/</u>
Lime Modified Soil	310.14	1 per 75 m (250 lf)	F.B., IDR	<u>12/</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.
- \*\* For items using aggregate of class RR3 or larger, the Resident has the option of documenting either depth checks or yield checks. Documenting depth checks is not required for removal-only items.
- 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. 420.18.
- 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. 420.18.
- 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. 420.18.
- 5/ Thickness determinations shall be made after placement of the top lift of binder and after placement of the surface course as a minimum requirement. Thickness determinations shall be made at intermediate lifts of the binder as required to maintain control of the placement operation. 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. 420.18.
- 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. 483.09.
- 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 3 mm ( $1/8$  in).
- 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 shown on the plans or established by the Engineer by more than 5 mm ( $3/16$  in).
- 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 5 mm ( $3/16$  in).
- 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.

#### **DOCUMENTATION PROCEDURES FOR CONSTRUCTION ENGINEERING PERFORMED BY CONSULTANTS**

Construction [Memorandum No. 61](#), paragraph 7(c), outlines the documentation requirements for all partial payments made to Consultants for construction engineering services.

The Consultant will periodically submit to the Resident an Invoice, Form [BDE 430](#) or [BDE 428](#), which will tabulate all costs being claimed. All personal services and direct costs being claimed must be documented with time cards, paid receipts and itemized statements.

The following two forms are to be used by the Consultant for documenting some of the applicable construction engineering costs:

Form <a href="#">BC 930</a>	Consultant Engineer's Weekly Personnel and Vehicle Time Distribution Record
Form <a href="#">BC 931</a>	Consultant Engineer's Private Vehicle Weekly Mileage Record

It is the responsibility of a District Representative to review the Invoice for correctness, sign it, and transmit the original and five copies to the Regional Engineer, keeping one copy for the project files.

The State Resident should make random checks from time to time to verify the information recorded by the Consultant on these forms. Random checks of information such as employee names, hours worked, consultant vehicle numbers, and odometer readings on private vehicles should be recorded and filed in the permanent project records.

### **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 weighings (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 is to be at the scale to witness the weighings 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. EXCEPTION: For Material Transfer Devices, all tickets must be collected and initialed by an IDOT inspector if the item is paid for by the ton.

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 weighed 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-82](#) 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 contractor's or supplier's loading operations make two separate weighings 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 operation. 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 bituminous 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 bituminous mixtures be equipped with automatic printers (Art. 1102.01(a)(9)). 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. 406.23(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 bituminous 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)(9) 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 mass (weight), the printer will record the gross mass (weight) as a minimum. Tare and net masses (weights) 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 mass (weight) 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 mass (weight) 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 mass (weight) 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 Weight Checks

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 [BC 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 (bituminous) 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 [BC 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 Office of Quality Compliance and Review (OQCR) is conducting random independent weight checks utilizing statewide independent scales. When an independent weight check is performed by OQCR, 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 Bituminous Mixtures 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 truck loads 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. Variation 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	6804 kg
2.	As you observe the scale dial stopping on or near the preset scale face marker, record the <u>actual</u> accumulative aggregate weight. Add in the mineral filler and paving asphalt weights.	1,805.0 1,792.0 1,882.0 1,796.0 1,860.0 <u>1,882.0</u> 11,017 kg
3.	Gross the truck on the platform scale.	17,872 kg

$$\begin{aligned}
 \text{Tolerance, 0.5\%} &= \frac{\text{net wt. (3 - 1)} - \text{summation of weighed batches}}{\text{net wt. (3 - 1)}} \times 100 \\
 &= \frac{11068 - 11017}{11068} \times 100
 \end{aligned}$$

= 0.46% O.K.

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 <u>after</u> it has been loaded. | 17,164.0 kg                     |
| 2. Empty it on the job.                                                                |                                 |
| 3. Tare the returning truck on the platform scale.                                     | 6,437.0 kg                      |
|                                                                                        | Actual net weight = 10,727.0 kg |
| 4. Record the load ticket                                                              | 10,886.0 kg                     |

$$\text{Tolerance, 0.5\%} = \frac{\text{load ticket (4)} - \text{actual net weight (1-3)}}{\text{actual net weight}} \times 100$$

$$= \frac{10886 - 10727}{10727} \times 100 = 1.48\% \text{ Recheck and/or recalibrate}$$

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 [BC 2367](#), or other methods using the above format. Results shall be placed in the job file.

**Aggregate Moisture Correction**

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:

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

$$(b) \text{ pay weight} = \frac{(\text{scale weight}) \times (1 + \text{allowable moisture})}{(1 + \text{actual moisture})} \quad \text{Example, page F-84}$$

**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-81](#)) In accordance with the Bureau of Materials and Research Policy Memorandum 6, Calculating and Adjusting of Application Rates for Agriculture Ground Limestone, 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:

$$\text{adj. pay weight} = (\text{ticket weight}) / (4 \text{ year source correction factor})$$

### **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:

- Aggregates - Not to exceed approximately 500 m ton (500 tons) per day.
- Bituminous mixtures - Mixtures for roadways should not exceed 250 m ton (250 tons) per day.
- Bituminous materials - Not to exceed approximately 4 m ton (4 tons) or 3800 liter (1000 gal) per day
- Other materials consistent with this section.

Unlimited quantities for the following items:

- Fertilizer Nutrients
- Calcium Chloride
- Hydrated lime for lime stabilized soil
- Agricultural 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.

### **DOCUMENTATION OF ROLLER WEIGHTS**

The Department has discontinued its requirement for the documentation of roller weights.

### **FINAL DOCUMENTATION**

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

- (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. Example, page [F-84](#).
- (e) Project diary for calendar month or calendar day items. (Not individual's diary)
- (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.
- (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.

All calculations made to determine final pay quantities must be checked by someone other than the preparer.

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 \_\_\_."