



LEDGE DATA AUTOMATION SECTION 3900

3900.1 SCOPE. To establish procedures for creating and maintaining a database of ledges to be used in conjunction with the inspection and reporting of aggregates.

3900.2 DESCRIPTION. These procedures are intended to supplement and compliment the Producer/Supplier database screen in the program identified as AASHTOWare. Maintenance of the ledges database is the responsibility of the District Geologist, in cooperation with Central Lab.

3900.2.1 The data in the Producer/Supplier database as set forth in Automation Section AS-3550 of this Manual must be correct before the ledges database can be accessed.

3900.2.2 Ledge information is entered as a Facility under the Primary Source by the Central Lab. This information includes ledges, shale seams, and overburden. The ledge database also includes source information concerning material taken from rivers, creeks, blown deposits, glacial deposits, mine tailing piles, and other such data.

3900.3 PROCEDURE (Maintained by Central Lab). Ledge data is entered in one standard format. Ledge data is given a ledge number as described in 3900.3.1.1 and is assigned the appropriate Formation name. The Location is set to "Ledge Sort Order;" without this designation the ledge will not appear on the quarry ledger report. A number is assigned as the Location Description. This number is responsible for the order that the ledges appear on the quarry ledger report. Combined ledges and Non-ledge data such as gravel, sand, and overburden are generally not assigned a number. These materials will not appear on the quarry ledger unless they are assigned a Location Description number, designated as a "Formation/Member," and have a location designated as "Ledge Sort Order." Editing ledge information is restricted to Administrators of SiteManager.

LEDGE DATA

3900.3.1 Ledge Data. When preparing to enter ledge data, the following information will be required.

3900.3.1.1 Ledge Number. This is a number assigned to the ledge by the District. The number may be numerical, alphabetical or a combination of numbers and letters if necessary, but it must be unique for this facility. It is preferable at a new source to restrict ledge identifiers to numbers. It is beneficial to reserve sequential numbers at both ends of the series to allow for additional ledges above and below previously identified ledges, or to verify that the depth of rock quarried cannot significantly change at this location. A ledge number is only assigned to material that is sampled for testing, that is, do not assign a number to a shale seam, etc. Ledge numbers are entered into SiteManager in the Producer/Supplier table under the Plant tab.

3900.3.1.1.1 A suggested system (but not mandatory) for logging new quarries is:

- a) Starting from the existing floor, number upwards. Should it later become necessary to subdivide a ledge, use letter suffixes, such a 2-A, 2-B, etc.



- b) Should the floor be deepened, if no lower numbers are available, assign capital letters to newly exposed ledges, progressing alphabetically downwards from the original floor, A, B, C, etc. If subsequently necessary to subdivide one of these ledges, add numerical suffixes as A-1, A-2, etc.

3900.3.1.1.2 It is not recommended that old quarries be renumbered. However, should it become necessary, care must be taken to correctly cross reference the old number in the data for the new number so the ledge can be traced historically.

3900.3.1.2 Thickness. The thickness of the ledge, shale seam, etc. is to be entered in feet. The thickness is entered by District Materials personnel on the #1 Physical Lab Free Form Test of the Sample Test tab immediately preceding the ledge description (i.e. 3.5' Limestone, brownish gray, medium grained, thin bedded, dense, brittle, containing numerous thin shale seams and calcite filled vugs). The thickness is to be the first entry on the far left of the Free Form Test and should be free of spaces. It may be entered as a range, a single number, or it may be entered as a number followed by \pm (Press Alt+241 from keypad). The thickness entered should not be less than 0.1' when entered as a number. When the thickness is entered as a range the numbers should be whole numbers, tenths of a foot should not be used.

3900.3.1.3 Formation or Member. The formation or member is entered depending on which is the most limiting designation. If a member is entered, the parent formation is implied and is not to be included in the field. The terms limestone, dolomite, etc. should not be used. A listing of current formations and members compiled from the present ledge data is shown in Table 1 of this section. The list is intended to include only those formations and members assigned a ledge number and intentionally incorporated into aggregates use for highway construction and maintenance. If a formation or member not shown in Table 1 is encountered the following instructions should be used for guidance in naming the member or formation.

3900.3.1.3.1 Stratigraphic identification should be as precise as possible, using the lowest known rank. Member is preferred if known, then formation and last, group. It is not necessary to identify the rank of the stratigraphic name assigned. For example, "Burlington" or "Chouteau" is sufficient rather than "Burlington formation" or "Chouteau group".

3900.3.1.3.2 Stratigraphic terminology in Missouri should be consistent with that used in The Stratigraphic Succession in Missouri, except where replaced by The Paleozoic Succession in Missouri. When logging ledges in adjoining states, publications of their respective state geological surveys should be your guide. Please note that the rock type is not included as part of the stratigraphic name. Use simply "Burlington", not "Burlington Limestone". Rock type should be part of the description on a columnar section.

3900.3.1.3.3 Where strata cannot be distinguished and you are listing two unrecognizable formations or members, the oldest has primacy and they should be shown with a hyphen rather than a comma or colon. For example, use "Jefferson City-Cotter", not "Cotter-Jefferson City", and "Burlington-Keokuk", not "Burlington,Keokuk". (If in a transitional phase, use both possible formation or member names rather than just one.) A listing of multiple but unrecognizable formations or members should be in order by age (oldest first) and separated by commas. Save the hyphen for indistinguishable formations or members.

3900.3.1.4 Los Angeles Abrasion (LA). The Los Angeles Abrasion (LA) test results for an initial sample will always be an integer number (no decimal point) between 0 and 100. Intermittent zones (Non-true ledges) do not have a value for LA..



3900.3.1.5 Specific Gravity (SPG). The specific gravity (SPG) for an initial sample is the Bulk Specific Gravity, generally between 1.5 and 3.0. The reported value is generally obtained from +4 material.

3900.3.1.6 Absorption (ABS). The absorption (ABS) for an initial sample is generally between 0.5 and 15.0. The reported value is generally obtained from +4 material.

3900.3.1.7 Soundness (T14 and T104). The LA, Soundness, SPG, and ABS are all entered on the test template Initial Sample Tests. If any test is not performed, those fields are left blank.

3900.3.1.8 Description. The Ledge Description is included in the same Free Form Test as the Ledge Thickness described in 3900.3.1.2. The ledge description is entered after the thickness. The ledge description can contain as many lines as necessary to describe the ledge. This exact description will then show up on the quarry ledger as the ledge description.

It is suggested that ledge description reflect the following example:

Limestone, brownish gray, medium grained, thin bedded, dense, brittle, containing numerous thin shale seams and calcite filled vugs.

The example has type of rock, color, grain size, bedding thickness and other descriptive information, presented in that order. This order is desirable but having all necessary descriptive information is more important.

Note: If the ledge is renumbered, combined, or split from the previous number, for historical purposes a brief comment is to be made here indicating what happened. This should only occur in rare instances.

3900.3.1.9 Material Code.

3900.3.1.9.1 For an initial sample, the material code is to be one of those from Table 2 of this Section. When testing is complete, the Central Laboratory enters the material code representing the approved use of a sample into test template Approved Use. Approval is based on final test results. Additional notes relating to the initial approval may be entered into Remarks on the Approved Use test template

3900.3.1.9.2 For a source sample, a material code is taken from the master list of aggregate material codes in AASHTOWare. The material code designated for a source approval must represent the aggregate product

3900.3.1.10 Ledge Stone Initial Approval Numbers.

3900.3.1.10.1 Initial Sample ID numbers are issued by the District sending in the sample and follow the procedures described in [QRG-Sample Record General Information](#).

3900.3.1.11 Source Approval Numbers.

3900.3.1.11.1 The Sample ID number assigned for a source sample is issued by the District sending the sample. The Sample ID numbering procedure is described in [QRG-Sample Record General Information](#).



3900.3.1.12 Los Angeles Abrasion (LA). The Los Angeles Abrasion (LA) test results for a source sample will always be an integer number (no decimal point) between 0 and 100. This value is obtained from test template T96 LA Abrasion.

3900.3.1.13 Specific Gravity (SPG). The Specific Gravity (SPG) for a source sample is Bulk Specific Gravity, generally between 1.5 and 3.0 and is obtained from test template T84 T85 Combined.

3900.3.1.14 Absorption (ABS). The Absorption (ABS) for a source sample is generally between 0.5 and 15.0 and is obtained from test template T84 T85 Combined.

3900.3.1.15 Soundness (T14 and T104). The Soundness for a source sample is entered as a numerical value and is obtained from test template TM14 Alcohol Freeze or T104 Sodium Sulfate. If a soundness test is not performed on the source sample, then the T14 and T104 tests are not added.

3900.3.1.16 When testing is complete, the free form template is attached by the Central Lab, stating the Formation and Ledges represented and the material acceptance or rejection. Example entry of free form for Source Approvals:

Material represents Ledge 1 Burlington Formation

Sample complies with Specification 1005 Gradation D aggregate for PCCP

NON-LEDGE DATA

3900.3.2 Non-Ledge Data. When preparing to enter non-ledge data such as a shale seam or overburden, the Plant ID (ledge) is designated with (., ..., etc.). The first non-ledge entry is designated with one period (.) and with each additional non-ledge entry additional periods are added.

3900.3.2.1 Ledge number. A ledge number is only assigned to material that is sampled for testing. Do not assign a ledge number to a shale seam, gravel, sand, overburden, etc. The Ledge Number for a sand or gravel is entered as either "SAND" or "GRAVEL" in place of a ledge number.

3900.3.2.2 Thickness. Entering the thicknesses of non-ledge data follows the same guidelines as those mentioned in section 3900.3.1.2. The thickness of the overburden, shale seam, etc. is to be entered in feet. It may be entered as a range and may be entered as a number followed by ± (Press Alt+241 from keypad). It is not reasonable to designate thickness less than 0.1' or to designate to tenths of a foot when entering a range.

SOURCE DATA

3900.3.3 Source data such as a "MISSISSIPPI RIVER SAND" or "SHOAL CREEK GRAVEL" is entered in the same field as the Formation or Member of a ledge. The Plant Type is designated as "Other Aggregate Source" in place of "Formation/Member."

3900.4 GENERAL.

3900.4.1 Each time ledge data is modified on the QLD Free Form Test, the information that is replaced by the modification is lost unless a copy of the previous ledge information is printed



and retained. The Central Laboratory keeps a copy of historical ledge information for quarries in each district.

3900.4.2 When initial sampling or re-sampling is done, the ledge descriptions are to be reviewed and modified as necessary. A copy of the revised quarry ledge data sheet is to be submitted with the ledge sample. The new sample information is to be entered in AASHTOWare. Cognos will automatically display the most recent test results.

3900.4.3 When laboratory results from the initial sampling are available they are to be entered into AASHTOWare (test template Initial Sample Tests). Cognos displays sample data with the most recent date for the quarry ledger report.

3900.4.4 When laboratory results from source sampling are available, the data is to be entered into AASHTOWare.

3900.4.5 Printing Quarry Ledge Data.

3900.4.5.1 Each district has the capability of printing the quarry ledge directories for any quarry in the state and may do so as needed. A current copy of all quarry ledge information can be obtained through the [Cognos](#) reports QLIS Initial or QLIS Source found at [Public Folders > SiteManager Reporting > Headquarters > Materials - Aggregates](#)



TABLE 1 FORMATION OR MEMBERS AUTOMATION SECTION 3900

AMAZONIA	HATTON TUFF
ARGENTINE	HERTHA
ARKANSAS NOVACULITE	HIGGINSVILLE
BAILEY	HINDSVILLE
BETHANY FALLS	JEFFERSON CITY
BLACKJACK CREEK	JEFFERSON CITY-COTTER
BLOYD	Keokuk-burlington
BONNETERRE	see BURLINGTON-KEOKUK
BURLINGTON	KEREFORD
burlington-chouteau	KIMMSWICK
see CHOUTEAU-BURLINGTON	KINCAID
BURLINGTON-KEOKUK	LEAVENWORTH
CALCAREOUS SANDSTONE	MYRICK STATION
*CALLAWAY	NORTHVIEW
CAMP NELSON (Kentucky)	PAOLI (Indiana)
CAPTAIN CREEK	PAWHUSKA (Oklahoma)
CARTERVILLE	PIERSON
CEDAR VALLEY	PITKIN
CHOUTEAU	PLATTIN
CHOUTEAU-BURLINGTON	PLATTIN-DECORAH
COAL CITY	PLATTSMOUTH
COMPTON	PORPHYRY
COOPER CREEK	POTOSI
CORALVILLE	REEDS SPRING
COTTER	ROUBIDOUX
COTTER-POWELL	SALEM
DAVIS	SEDALIA
DECORAH	SHELDON
decorah-plattin	SOUTH BEND
see PLATTIN-DECORAH	SPRING HILL
DERBY-DOE RUN	ST. LOUIS
EMINENCE	ST. LOUIS-STE. GENEVIEVE
ERVINE CREEK	STE. GENEVIEVE
EXLINE	STONER
FERN GLEN	TORONTO
FRISBIE	WARSAW
GASCONADE	WINTERSET
GRAND FALLS	WORLAND
GRANITE	

*Now designated as "Cedar Valley"



**TABLE 2
PRELIMINARY APPROVAL CODES
AUTOMATION SECTION 3900**

<u>SUITABLE USE</u>	<u>Code</u>
Initial Approval all types of Highway Construction (includes 1003 Grade A)	1005CACP.
Initial Approval all types except PCCP and 1003 Grade A	1005CACM.
Initial Approval all types except PCCP, PCCM and 1003 Grade A (includes 1003 Grade B and C)	1002CAAC.
Initial Approval for Bituminous & Aggregate Surface and Aggregate Base	1004CABS.
Initial Approval for Aggregate Surface and Aggregate Base	1006CAAS.
Initial Approval for Aggregate Base	1007CAAB
Aggregate Rejected for All Purposes	1000XX.

