APPLICATION OF QUALITY ASSURANCE SPECIFICATIONS

for

EMBANKMENT and BASE COURSE
2016

Jointly Developed by the
Technology Transfer and Training
and
Materials and Construction Sections
of the
Louisiana Department of Transportation and Development

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QUALITY ASSURANCE SPECIFICATIONS
FOR
EMBANKMENT and BASE COURSE

Developed by

TECHNOLOGY TRANSFER AND TRAINING

LOUISIANA TRANSPORTATION AND RESEARCH CENTER

For

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2016

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TABLE OF CONTENTS

TOPIC **PAGE**

Foreword 1

Materials 3

General 3

Excavation 3

Borrow 4

In-Place Materials 4

Stockpiles 5

Cement 6

Water 6

Lime 6

Blended Calcium Sulfate 7

Geotextile Fabric 8

Backfill Materials – Sections 700 & 800 8

Soil Usage Chart 9

Required Lime Treatment Chart 9

Equipment

Plant Equipment

Central Mix Plants 11

Central Mix Plants - Feeder System 13

Central Mix Plants - Mixing System 14

Scale and Meters 16

Feed Bin Calibration 16

Roadway Equipment

Haul Equipment 17

Placement and Spreading Equipment 18

Compaction Equipment 18

Distributors 19

In-Place Mixing and Additive Spreader Equipment 20

TABLE OF CONTENTS

TOPIC **PAGE**

Laboratory and Testing Equipment

Automated Compaction Hammers 21

Nuclear Density Gauge 21

Other Laboratory Equipment 22

Personnel Training and Certification 23

General Certification Requirement 24

Certified Personnel

Department 24

Nondepartment 25

Quality Assurance/Control

Quality Assurance 27

Quality Control 28

Plant Operations 29

Construction Practices

Construction Layout 33

Traffic Control 33

Construction Details 34

Weather Limitations 34

Pulverization 35

Spreading Cement 36

In-Place Mixing 36

Moisture Content 37

Joint Construction 38

Compaction 38

Finishing 39

Scarifying and Compacting 40

Compaction – Pipes, Manholes, & Boxes 41

TABLE OF CONTENTS

TOPIC **PAGE**

Environmental Concerns 43
Hazardous Materials 43
Erosion and Pollution Control 44
Archaeological or Paleontological Inspections 46

Acceptance 49
Sampling and Testing 49
Visual Inspection 50
Embankments 51
Embankment Zones 52
Base Courses 52
Pipes, Drainage Structures and Boxes 53
Quality Control (QC) 53
Dimensional Tolerance 53
Composite Bases 54

Measurement and Payment
Dedicated Stockpiles 55
Acceptance Without Payment Adjustment 55
Acceptance With Payment Adjustment 56
Example of Cumulative Payment Adjustment 57
Removal and Replacement of Base 57
Placing Backfill 58

TABLE OF CONTENTS

TOPIC **PAGE**

Special Areas of Consideration by Section:

201- Clearing and Grubbing 59
202 - Removing or Relocating Structures and Obstructions 65
203 - Excavation and Embankment 67
204 - Temporary Erosion Control 77
301 - Class I Base Course 83
302 - Class II Base Course 91
303 - In-Place Stabilized and Treated Base Course 93
304 - Lime Treatment 97
305 - Subgrade Layer 107
306 - Scarifying and Compacting Roadbed 109
307 - Permeable Bases 111
309 - In-Place Cement Treated Subgrade 113
701 - Culverts and Storm Drains 115
702 - Manholes, Junction Boxes and Catch Basins 121
802 - Structural Excavation and Backfill 123

TABLE OF CONTENTS

APPENDIX **PAGE**

Borrow Pit Sketch - Example A-3

Borrow Pit Location Map – Example A-5

Right of Entry A-7

Certificate of Release A-9

Transition from Cut to Fill - Example Sketch A-11

Certificate of Material Proportions for Base Course (03-22-0751) A-13

Density & Moisture Content Worksheet (03-22-0750) A-15

J-Stitch Sketch for Geotextile Fabric A-17

Inspection Report - Archaeological or Hazardous Materials
(excerpt EDSM III.1.1.22) A-19

Equipment Inspection and Certifications

- Haul Equipment A-21
- Compaction Equipment A-23
- Distributors A-25
- Plant Equipment
  - Plant Certification Sticker A-27
  - Base Course Central Mix Plant Certification Report (03-22-0753) A-29
  - Certification Report for Scales and Meters (03-22-3065) A-35
  - Base Course Design for Central Plant Materials Mixtures (03-22-0752) A-37
  - Feed Bin Calibration Curves - Example A-39
  - Daily Central Mix Plant Report (03-22-0754) A-41

Environmental Documentation

- Standard Plans Index (online addresses) A-43
- Pollution Prevention Certification Statement A-45
- Notice of Intent (portion, pgs. 1-7 of 16) A-47
- Notice of Termination A-55

Other Documents

- Attachment 7 ..... A-57

FOREWORD

This manual is designed to standardize Louisiana Department of Transportation and Development (LADOTD) policies and procedures for embankment, base courses, and related construction or reconstruction using soils and aggregates. It references applicable sections of 201, 202, 203, 204, 301, 302, 303, 304, 305, 306, 307 and 309, and the earthwork involved in Sections 700 & 800 of the *LADOTD Standard Specifications for Road and Bridges, and any supporting Supplemental Specifications.* This manual details the responsibilities of the contractor and the Department (LADOTD) in the following areas.

- certification
- design
- production
- transportation
- placement
- quality control
- inspection
- acceptance

Other detailed manuals are available for use when references are made to asphalt concrete and Portland cement concrete pavement and structures and should be consulted. This manual will refer to these sections when differences occur or for clarity.

While soils and the handling methods of the people who work with them are widely variable, the LADOTD methods of acceptance and measurement are much more consistent. This manual cannot describe every condition a contractor, inspector, or engineer may encounter in the field, but it can demonstrate procedures to best handle the majority of conditions found in Louisiana.

This manual is to be used in conjunction with the 2016 Edition of the *Louisiana Standard Specifications for Roads and Bridges.* Relevant specifications are referenced throughout this manual. Some specifications may be repeated in order to further detail or demonstrate how they are applied. **All specifications, manuals, forms, and spreadsheets are subject to change.**

Contract documents for each project should be reviewed for any specific change, update, and/or addition.

As such, in accordance with Section 105 of the *Louisiana Standard Specifications for Roads and Bridges*, in case of discrepancy, the following order of precedence will apply:

1) Special Provisions
2) Plans
3) Supplemental Specifications
4) Standard Specifications (for which this manual is referenced)
5) Standard Plans

MATERIALS

GENERAL

It is the contractor's responsibility to locate and furnish materials, which meet specifications. It is also the responsibility of the contractor to ensure that those materials, after being placed and processed, will meet Department acceptance criteria. Once the contractor feels certain that the proposed material sources will meet specifications, it will be the contractor's responsibility to request acceptance testing and approval of those sources by the Department. The contractor is responsible for coordinating the arrangements for testing and approval and the planned work schedule with the project engineer and the district laboratory engineer **so that sampling and testing of materials is completed prior to their planned incorporation into the project.** Failure to do so will result in a delay of the contractor's proposed schedule, since no material can be placed on a project without approval.

EXCAVATION

Soils vary both laterally and vertically within a source. Therefore, the method of excavation can contribute to the variability of material on the project. Contractors must obtain uniform materials. If the contractor's methods of obtaining soils contribute to their non-uniformity, the engineer will direct that these methods be altered to ensure the placement of uniform material on the project.

When excavating in-place materials in locations previously tested by the Department during the design phase, a close inspection of uniformity of those materials and acceptance testing will still be required in most cases (refer to the Materials Sampling Manual for testing schedules). If materials are found to be significantly different or unsuitable, the materials will not be incorporated.

BORROW

Borrow is defined as soil or soil-aggregate not found within the limits of the project.

Refer to pages 64 and 65 for instructions concerning the submittal of borrow materials to the district lab for acceptance. The contractor will test or use a private laboratory to test all borrow materials, and be reasonably certain of their suitability before submitting to the Department for acceptance.

IN-PLACE MATERIALS

Generally, the base materials to be used for in-place stabilization or treatment will be found in the roadway embankment or base section within project limits. They may include raw or treated sand clay gravel or aggregates, asphalt concrete/soil blends, embankments, stabilized soil, etc. These materials, though previously tested by the Department, will be reexamined for the purposes of classification and additive design, normally at the time the Department was designing the roadway. Cement factors may then be placed in the contract.
If there are no cement factors in the contract, and none has been predetermined, project personnel will sample the in-place material from selected sites after it has been satisfactorily pulverized and blended by the contractor. The sample will be delivered to the district laboratory for the determination of cement factor. **In order to ensure an effective, timely operation, it is critical that the contractor's operation and project engineer's sampling and delivery to the district laboratory be closely coordinated.**

If unusual conditions of the soil are encountered or if the resulting blend of materials will not stabilize, the contractor shall furnish material in addition to the in-place material. When the contractor supplies material for stabilization, the materials supplied shall meet the material specifications for their applicable section. It shall be the responsibility of the contractor to locate and provide these materials, making sure they meet the specifications, and are appropriate for use.

STOCKPILES

Stockpiles at a central mix plant shall be built on a well-drained surface, far enough apart that no intermixing of materials will occur during operations. If the area is not large enough to permit adequate distance between stockpiles, a bulkhead shall be erected of sufficient height and length to prevent intermixing of materials or spillage over the top between the stockpiles. The method of removing material from the stockpiles must be approved prior to the beginning of plant operations and will be subject to continual Department inspection for satisfactory operation. No contamination or intermixing of materials between stockpiles shall occur during the removal of material from stockpiles.

When constructing Class I Base Course all soils and aggregates shall be placed in dedicated stockpiles.

Materials to be placed in a single stockpile shall be uniform in terms of classification, moisture content, moisture-density relationships, gradation, feedability (flow), stabilization, and compaction characteristics.

Additionally, soils in a single stockpile must exhibit close moisture-density relationships. If the moisture-density relationships of materials vary, the compaction required for each of those materials may vary as well. The uniformity of the material will directly help to produce better compaction results and, ultimately, less risk to the contractor by maintaining consistent compaction processes.

When stockpiles are excessively wet, production should cease until the material dries or can be processed. It is not acceptable to attempt to dry excessively wet material during blending, hauling, or placement on the project without approval from the engineer.

CEMENT

The contractor shall protect cement at a central mix plant to prevent the intrusion of dampness, water or other contaminants. Cement that has partially set or has visible signs of moisture damage shall not be used. Seals from transports shall be checked to ensure that they match the numbers on the Cement Certificates of Delivery. If the seal number does not match the Cement Certificate of Delivery, the transport of cement is not to be accepted.

Cement to be used for In-Place Cement Stabilized Base Course shall be delivered in sealed transports. Each transport shall be accompanied by a Cement Certificate of Delivery. It shall be the responsibility of the Department to verify that the transports are sealed and that the seal number matches that indicated on the Cement Certificate of Delivery.

WATER

Water shall be from approved sources and shall not be contaminated during storage or handling.

Water pumped from natural sources should be checked for possible detrimental interactions with cement, especially those near sugar producing fields and transport roads.

LIME

All lime used in any type of treatment must be from an approved source listed in AML, either Hydrated or Quicklime may be used. The most common form of lime used in construction is dry, hydrated (powder) lime. Quicklime (non-hydrated) comes in granular form (pelletized) in two different gradations, a 3/8-inch size, which the Department allows to be used in the same manner as powdered lime, and a 3/4 inch size, which can be used for forming lime/water slurries.

Since quicklime is non-hydrated, it has a high demand for moisture. This characteristic creates a potential health concern that requires constant vigilance on the part of personnel as this material can cause serious burns if contact with human tissue occurs.

Lime may be applied directly to the prepared surface or may be mixed with the material in a central mix plant. In dust sensitive areas, designated in the plans, either granular (pelletized), slurry application, or central plant mixing may be required. The engineer will approve the type of material and application method to be used.

A Certificate of Delivery shall accompany each transport. It shall be the responsibility of the Department to verify that the transports are sealed and that the seal number matches that indicated on the Certificate of Delivery.

Lime must be protected from moisture prior to application or mixing in a plant or slurry. Caked or contaminated lime is not to be used. Any lime not processed within 6 hours and lime lost or damaged before incorporation due to rain, wind or other cause will be rejected, deducted from measured quantities, and shall be replaced by the contractor at no direct pay.

Lime oxidizes when exposed to the atmosphere and loses its ability to react chemically with the soil. Lime exposed to air prior to placement, stored for an excessive length of time, or for which there is a significant delay between placement and mixing is not to be used. If the lime's usability is questionable, project personnel are to sample the lime and submit it to the Materials and Testing Section for evaluation.

BLENDED CALCIUM SULFATE

Blended calcium sulfate may be used as a non-plastic embankment, base course, or untreated subgrade layer. Blended calcium sulfate may be blended with an approved limestone or lime for pH control and placed in dedicated stockpiles. All sampling will be accomplished in accordance with the applicable specification.

GEOTEXTILE FABRIC

Geotextile fabric shall not be unwrapped prior to use and shall be spread directly in front of the operation. Geotextile fabric exposed to sunlight prior to installation will be tested for ultraviolet damage prior to placement. Geotextile fabric that has been installed shall be covered with embankment within seven calendar days. Installed fabric that is not covered within seven calendar days shall be removed and replaced or protected from further light damage until test results are obtained.

The specifications allow geotextile fabric to be joined by either overlapping or sewing depending on the location of the seam and use of the fabric. When soil is inundated with water or saturated, the fabric must be sewn. When edges are sewn, Standard Specification Section 203 requires the use of the ***J***-Stitch with a Type 401, two-thread chain stitch. To create a ***J***-Stitch, two parallel edges are placed together, turned in the same direction, and sewn. Refer to the diagram on page A-17 in the Appendix for a sketch of a completed ***J***-Stitch. Industry standards recommend two - four inches of overlap when making the J-stich. The number of lines of stitching required shall be in accordance with the plans or as directed by the Design Section. The 401 stitch is a locking stitch that protects the seam from unraveling if a thread breaks. Standard Specification Section 203 requires thread of polyester or Kevlar. These materials are resistant to moisture damage.

BACKFILL MATERIALS – SECTIONS 700 & 800

Type-A backfill material shall be stone, recycled Portland cement concrete, flowable fill, or RAP that meets the requirements of Standard Specification Section 701.

When a soil or aggregate Type-A backfill material is used, geotextile fabric shall be placed in accordance with plan details prior to placing backfill material. Care shall be taken to prevent damage to geotextile fabric during placement of backfill material. When flowable fill is specified, or allowed, the contractor shall submit a mix design for approval. The mix design and control of the mixture will follow the general guidelines of Standard Specification Section 710 and the appropriate Application of Quality Assurance manual.

Use excavatable flowable fill except where noted in the plans.

Type-B backfill material shall be selected soils. Selected soils placed as backfill for corrugated metal pipe must also meet resistivity and pH requirements. The resistivity of the material shall be

greater than 1500 ohm-cm when tested in accordance with DOTD TR 429. The pH shall be greater than 5.0 when tested in accordance with DOTD TR 430.

Exposed pipe backfill shall be covered with an outside layer of plastic soil blanket in accordance with Standard Specification Section 203.

SOIL USAGE CHART

The following chart details all the different classes or categories of soils used for DOTD projects.

	PI		**LL**		**pH**		**Sand (max)**	**Silt (max)**	**%Organic (max)**
	min	max	min	max	min	max			
Usable Soil	11*	25						50*	5
Usable Soil-Header	11	25						65	
Non-plastic Embankment	See Section 1003								4
Plastic Soil Blanket	11	35			5.5	8.5		65	3
Soil for Soil Cement 301	0	12	0	35			79	60	2
Soil for Soil Cement 302	0	15	0	35			79	60	2
Soil on Cut Slope	10				5.5	8.5			
Soil for Subgrade Layer	0	35					79	69	
Selected Soils/ Soil for Type-B Backfill	11*	20	0	35			N/A	50*	5
Soil for Temporary Diversion		45						75	

Soils with a silt content of 50% or greater and also a PI of 10 or less will not be allowed

SPECIAL CONDITIONS OF PLASTIC INDEX USE

REQUIRED LIME TREATMENT CHART

The following chart gives the amounts of lime, when required, for treatment of soils used in the conditions separated below.

SOIL USAGE	PI	LIME TREATMENT
Headers (full height)	11 - 25	None Allowed
Embankments (non header)	0 - 25 26 - 34	None Required 6% by Volume*
		*Treatment shall conform to Type-E (Section 304)

EQUIPMENT

Prior to construction, the project engineer will inspect the equipment to be used on the project to ensure that it is in good condition and appropriate for the activity for which it is to be used. The project engineer will supply the District Laboratory with a list of any equipment requiring certification prior to that piece of equipment being used on the project. The project engineer will require that leaking or damaged equipment be repaired or replaced before it operates on the project. The project engineer will require the replacement of equipment that is not appropriate for the project prior to its being used.

During the progress of construction, the contractor's personnel are to inspect equipment daily to ensure that it has been maintained in good condition and that no damage that could affect its operation has occurred. Damaged equipment shall be repaired prior to its continued use. Project personnel will evaluate the effectiveness of equipment. Equipment which does not perform properly or which does not produce a quality product meeting specifications is to be replaced with acceptable equipment.

PLANT EQUIPMENT

Central Mix Plants

Central mix plants required for Soil Cement and Cement Stabilized Class I Base Courses under Standard Specification Section 301 must be certified. Certification procedures for these plants will be in accordance with this manual. When a contractor elects to use a central mix plant to produce cement stabilized or treated base course not under Standard Specification Section 301, the plant must meet the specification requirements of Standard Specification Section 301, including certification. For base course or subgrade layers constructed of asphalt or Portland cement concrete, plants producing those materials will be certified and operated according to applicable specifications and Quality Assurance methods.

The central mix plant and location shall be maintained in a safe, clean condition. The plant shall be equipped with a laboratory conforming to Standard Specification Section 722. The plant shall be located where it will not be necessary for haul trucks to traverse any newly placed base course. The district laboratory engineer will approve testing equipment. Scales and metering devices will

be calibrated, documentation submitted to the district laboratory engineer, and their calibration approved by the district laboratory engineer prior to production. Calibration shall be by an approved, independent service or by the Weights and Measures Division of the Department of Agriculture and Forestry. Independent calibration services must be licensed by the Department of Agriculture and Forestry.

The LADOTD laboratory in the district in which the plant is located will certify plant equipment (except sampling and testing equipment) and plant operations, as well as evaluate and approve materials prior to the delivery of any mixture to a DOTD project. Plant certification requires an on-going, in-depth inspection by district laboratory personnel to ensure that the plant's equipment, stockpiles, storage bins, scales, metering devices, etc., are in conformance with Department specifications and standards. It is the responsibility of the contractor to keep the project engineer and the district laboratory engineer informed of the sequence of plant installation and stockpile construction. Failure to keep the Department informed of the status of the plant's installation sequence may cause delay in plant certification and production for DOTD projects.

Certification by the district laboratory signifies that the plant is capable of producing cement stabilized or treated mixtures that meet Department standards of quality. Therefore, in order to become certified, a plant must be in production and able to demonstrate its performance. **Material produced during the certification process shall not be incorporated into the project without approval.**

Plant certification is valid for two years, provided the plant is maintained in accordance with the conditions under which certification was issued. Relocation of the plant will invalidate certification. A certification sticker will be placed in an obvious location on or near the control panel of a certified plant. An example of this sticker is reprinted in the Appendix on page A-27.

The district laboratory will re-inspect the plant for conformance to certification requirements at least every 90-calendar days. The LADOTD certified inspector inspects the plant and operations on a daily basis to ensure that the equipment and activities are within requirements. Inspections by the laboratory will be made more frequently if equipment, materials, or processes are modified or if deficiencies occur. **It is the responsibility of both the contractor and Department personnel to notify the certifying district laboratory when modifications are made to equipment, processes, or materials**.

The *Base Course Central Mix Plant Certification Report* (DOTD Form No. 03-22-0753) will be used to inspect the central mix plant for conformance to certification requirements and to document this inspection. Likewise, construction personnel will use this completed form for daily plant inspections. A reprint of this form begins on page A-29 in the Appendix.

Department representatives shall be allowed free access to plant facilities for inspection of plant and operations and certification. Inspections will be conducted at the option of the Department, and shall not relieve the contractor of any responsibility under the specifications. The completed form (DOTD Form No. 03-22-0753) is used for ninety-day review inspections or any intermediate inspections that may be required. Ninety-day review and intermediate inspections will be documented by date, remark, and signature at the end of the form. The completed form will be kept on file at the district laboratory and a copy sent to the project engineer(s) receiving material from the plant, the DOTD Materials Engineer Administrator, the DOTD construction section, and the contractor.

When a plant certified by the Department fails to conform to the Department standards, the certification will be revoked. The certifying district laboratory engineer can revoke plant certification. The project engineer or the LADOTD certified Embankment and Base Course Inspector have the authority to discontinue plant operations when a plant or the mixture exhibits deficiencies. When this occurs, it is the responsibility of the project engineer or certified inspector to notify the district laboratory engineer immediately, so that the plant's certification status can be reviewed. **Once certification has been revoked, the plant will be prohibited from supplying material for any Department project until all deficiencies have been corrected and certification is reinstated.**

Central Mix Plants - Feeder System

The feeder system of the central mix plant is composed of bins, belts, scales, a moisture control mechanism(s), an automatic shut-off device(s), and any other plant components used to move or temporarily store soils, aggregates, and cement between the stockpiles and the pugmill. Feed rates shall be adjustable. When control is accomplished by gate openings, the gates shall be adjustable and lockable. Belt speed shall be adjustable to control plant production rate.

Bins shall be free of holes, shall not allow material to bridge or collect in corners, and shall not allow material to intermix at the top or during loading. If vibrators do not effectively result in an even flow of material through the bin, other methods shall be used to achieve satisfactory results. Material will not flow through a bin if it is too wet; in this situation, it will be necessary to allow time for the stockpile to reach a lower, uniform moisture content.
Belts shall be free of sags, tears, or holes. Belts shall move smoothly and carry material from bins to the pugmill without spillage.

The moisture control mechanism will consist of the spray bar and metering or weighing system. It shall be capable of adjusting the flow rate, and of being locked into position. The spray bar shall apply water uniformly across the full width of material. Blocked nozzles shall be cleaned immediately. When nozzles become blocked, operations will be stopped immediately until they are cleared. Lines shall not leak water.

An operational variation of 1% by weight in cement is allowed. The tolerance of 1% by weight is only intended to compensate for normal variations in plant operation. For aggregates and soils, the specifications allow an operational variation of 2% of the individual weight of each component; however, the total weight of the aggregate and soils shall be within 1% of the required weight of the total material.

Central Mix Plants - Mixing System

The Central Mix Plant mixing system shall be adequate to handle the production rate on the *Base Course Design for Central Plant Materials Mixtures* form (a reprint of this form, DOTD 03-22-0752, is on page A-37 in the Appendix.) It shall provide a uniformly blended material, showing no segregation. All paddles shall be in place and within the manufacturer's requirements for wear. The mixing chamber shall be equipped with a spray bar to provide uniform water spray to the material during mixing with volume and spray pattern adjusted to ensure that the material will be uniformly at the proper moisture content during compaction. Gates shall lock and not leak during mixing.
To regulate the mixing time, the mixing system in a batch type plant shall be equipped with an automatic timing device that counts in seconds. The automatic timing device is interlocked with the mixing system of the pugmill.

For continuous type plants, to ensure a uniform blend, the feeder system shall be coordinated with the pugmill to match the feed rate to the mixing rate. The mixing rate is the speed at which the pugmill can uniformly mix and discharge the materials. The mixing system shall be arranged to discharge the material completely; no build-up shall occur in the mixing chamber. Material shall be discharged directly into haul trucks.

MATERIAL	MEASURING DEVICE ACCURACY	FEED TOLERANCE
Soil/Soil-Aggregate	0.05% (wt)	2% (wt)
Cement	0.05% (wt)	1% (wt)***
Water	1% (vol) 0.5% (wt)	**
Liquid Additive	3% (wt)	3%

* Individual aggregates and soils within 2% of individual weight. Total weight of aggregate within 1% of total material weight.

** Must be accurate enough to ensure 2% of optimum at time of compaction.

*** Tolerance for payment adjustment in accordance with Table 301-4 is not affected by this feed tolerance.

CALIBRATION AND FEED TOLERANCES

NOTE

Exceeding the feed tolerances will cause the inspector to require the contractor to discontinue operations. Varying within the limits of the feed tolerances can result in payment adjustments.

Scale and Meters

In order to meet certification requirements, the contractor shall arrange for all plant scales and meters to be calibrated at least every 90 days by the Weights and Measures Division of the Louisiana Department of Agriculture and Forestry or an approved independent company. **Approved independent companies must be licensed by the Louisiana Department of Agriculture and Forestry. The district laboratory engineer will approve the independent companies for the district.**

The calibration of scales and meters shall state that the equipment meets all Department requirements for accuracy. The calibration shall be documented and reported to the district laboratory engineer on the *Certification Report for Scales and Meters* (DOTD Form No. 03-22-3065). A reprint of this form is on page A-35 in the Appendix. The technician representing the independent company shall sign and stamp the form with the company's identification and/or attach the company's scale certificate. The technician shall place a dated calibration sticker on each device.

Feed Bin Calibration

When a plant is controlled by feed bins, the contractor shall develop feed bin calibration curves for each type of material, denoting rate of feed expressed in terms of belt speed and gate opening. These curves shall be submitted to the district laboratory engineer for approval prior to certification inspection. Certification will not be awarded to a plant until these curves are approved. An example of these curves is shown on page A-39 in the Appendix.

ROADWAY EQUIPMENT

Equipment used for construction under Specification Parts II, III, or IV must be approved. Certification is not required, except for asphalt distributors when specified, and haul trucks **traveling public routes. Procedures for the approval of this equipment will be in accordance with** this manual. When a Class I, or Class II base course, or treated subgrade layer is asphalt concrete, placement and compaction equipment must be certified. The certification requirements shall be in accordance with Specification Part V (500) and the *Application of Quality Assurance Specifications for Asphalt Concrete Mixtures*. When Portland cement concrete is used in lieu of other base course material, placement, compaction, and finishing equipment shall meet the requirements of Standard Specification Section 706.

Haul Equipment

Trucks used to transport embankment and base materials are to be inspected prior to use and daily by project personnel. Trucks that haul material over state or federal roadways shall be weight certified. A reprint of EDSM III.1.1.12 - Haul Equipment Certification is on page A-21 in the Appendix. Trucks shall be capable of hauling without loss of material, excessive drying, or segregation. If necessary, covers may be required to prevent non-uniform moisture contents or loss of fines. Beds shall be smooth metal, clean, with no holes. Extensions shall meet the requirements of EDSM III. 5.1.3. "*… Any increase over the original capacity must be accomplished by use of a single increment, securely fastened to the bed by means of bolts or welded metal plates. Nailing will not be acceptable."*

Covers shall be large enough to completely cover the mixture and extend over the sides and ends of the bed, be in good condition with no tears or holes, and be equipped with adequate tie-downs. Covers are to be large enough to prevent excessive air circulation or the intrusion of rain.

Equipment shall be in good working condition and shall not leak fluids onto the grade or roadway. When approved equipment fails to meet these requirements, it shall be removed from the project until repairs are made and approval reinstated.

Placement and Spreading Equipment

Class I Base Course shall be placed and spread without segregation and in uniform thickness and fluff to allow for uniform compaction and finish to plan dimensions, cross slope and grade. The equipment shall leave the material at a uniform moisture content, without excessive drying.

Class I Base Course shall be finished with an approved automatic finishing machine. The approved automatic finishing machine shall be capable of being operated from an erected stringline, and capable of automatically controlling grade and cross slope meeting the applicable requirements of Standard Specification Section V (500). The finishing machine shall leave a smooth surface at proper, uniform grade and cross slope. The finishing machine shall leave no loose material on the surface. The automatic finishing machine shall cut the material across the full width of the roadway without damaging the surface. **Cold planers will not be approved.**

Compaction Equipment

Rollers for Class I Base Course may be either self-propelled or tractor powered. When vibratory compactive effort is permitted, the rollers shall be capable of independently controlling amplitude and frequency.

When a Class I, or Class II base course or treated subgrade layer is asphalt concrete, placement and compaction equipment must be certified. Equipment shall be in good working condition and shall not leak fluids onto the grade or roadway. When approved equipment fails to meet these requirements, it shall be removed from the project until repairs are made and approval reinstated.

Vibratory compaction equipment shall not be used in areas of excessive moisture, perched water tables, where underlying courses have not been compacted with vibratory equipment, or where the compaction characteristics of the soil are not compatible with vibratory compaction (for example, soils with high silt content are not readily compacted with vibratory equipment.) If the use of vibratory equipment results in damage to the embankment, or underlying support layers, the use of the equipment shall be discontinued immediately. The contractor shall correct damage caused by the improper use of vibratory compaction equipment, as directed, at no direct pay.

Stone, recycled Portland cement concrete, and crushed slag shall be compacted with equipment designed for the compaction of each specific material.

The compaction equipment may be either static or vibratory. The Department reserves the right to require only static compaction equipment when the engineer determines that vibratory compaction may damage the base course or underlying or adjacent materials. (Examples of indications of damage to the base or underlying layers are loss of density, cracking, movement, free water, perched water tables, breaking down compaction in underlying layers due to silty or sandy characteristics, etc.)

The compacted aggregate material shall be finished with pneumatic tire rollers or static, smooth, steel-wheeled rollers as required by the specifications.

Stabilized base course shall be initially compacted with a conventional sheepsfoot roller or a self-propelled tamping foot compactor-type roller. The spikes shall be sufficient in size and number to provide uniform compaction for the full width and depth of the base course. **Compaction equipment with smooth wheel vibratory rollers, steel wheel, or pneumatic rollers will not be permitted for compaction.** Such equipment will cause lamination and non-uniform compaction, even though the average density may meet specifications. The non-uniform density caused by this equipment will lead to premature failure due to the lack of adequate density in the bottom of the base course.

The compacted stabilized material shall be finished with pneumatic tire rollers. The pneumatic roller shall have an odd number of tires, arranged so that the spaces between one row of tires are covered by the tires of the other row. All tires shall be in place, properly inflated and in good condition, and properly inflated. Tires shall be smooth tread, of the same size and ply, and inflated to within ± 5 psi of each other. A reprint of form DOTD 03-33-3050 - **Compaction Equipment** Certification is on page A-23 in the Appendix.

Distributors

When prime coat is being applied, the asphalt distributor shall conform to the equipment Standard Specification Section 503, as required by Standard Specification Section 505. Asphalt distributors used to spray prime coat over the completed base shall be equipped with a spray bar that uniformly sprays the prime coat across the surface and does not apply the prime coat in streams

or cause it to puddle on the surface. Clogged nozzles will not be allowed. Asphalt distributors shall be weight-certified, and shall not be loaded in excess of the permitted load limit.

Equipment used to distribute asphalt-curing membrane shall conform to Standard Specification Section 506. Asphalt distributors spraying asphalt-curing membrane must be equipped for easy determination of the rate of application.

Water trucks are to be equipped with spray bars that uniformly spray water across the surface and do not apply water in streams or cause water to puddle on the surface. Water trucks shall be weight-certified and shall not be loaded in excess of the permitted load limit. Water trucks may be used to spray water over the surface of the completed base during finishing operations and to maintain moisture content only. **They are not to be used to apply water directly to the base prior to or during the mixing process.** Water trucks are also used to supply water to the in-place mixer. The tank or connections with the in-place mixer are not to leak allowing water to fall directly onto the base course. All spray nozzles must be clean and functioning properly. A reprint of form DOTD 03-33-3050 – **Asphalt Distributor Certification** is on page A-25 in the Appendix.

In-Place Mixing and Additive Spreader Equipment

The in-place mixer is used to blend and pulverize the base material prior to the incorporation of cement. The equipment used for preliminary blending shall be capable of achieving specification requirements for the pulverization of the untreated base material.

The in-place mixer shall be designed for soil cement construction, shall have sufficient tines, arranged in a configuration that will result in a uniform blend of base material, cement, and water, across the full width of the roadway. It will be equipped with a spray bar system adjustable across the width of the stabilizer box and on each end to prevent overlapping of water from one path to an adjacent path. The spray nozzles shall be equipped with individual cutoffs to block nozzles as necessary to prevent excessive moisture content and overlap of water. Any overlap of water spray leads to excessive moisture in narrow strips, resulting in density problems and early roadway failure. Clogged nozzles shall be immediately cleaned and restored to normal function before operations are continued.

When required by the plans or by the engineer, the cement spreader shall have a mechanically adjustable, calibrated spreader box. The box shall be calibrated to distribute cement at the required cement factor. Equipment that adjusts the rate of spread solely by means of adjusting forward speed is not to be used. The spreader shall be operated to distribute cement over the prepared surface at a uniform rate for the full length and width of the spread, without excessive dusting. The spreader shall be mechanically adjustable for variable spread widths. Excessive dusting also indicates that the minimum cement factor is not being met due to material loss. If the equipment cannot be recalibrated and adjusted properly, replacement will be required. Back-up equipment must meet the same requirements as the primary equipment. If the primary equipment is replaced with the backup equipment and the spreading problem is not corrected, operations will be discontinued until additional equipment is provided, inspected, and approved.

Scarifying Equipment shall be capable of scarifying and blending the full width of the roadway to a minimum depth of six inches or plan depth. All teeth on the Scarifier shall be in place and adequate to break up the existing roadbed into a uniform, compactable material.

LABORATORY AND TESTING EQUIPMENT

Automated Compaction Hammers

Automated compaction hammer will be as described in Standard Specification Section 722. Verification, by the engineer, of the hammer operation will be conducted on the first day of mixing by comparing automatic compaction results with DOTD calibrated manual rammer results. A typical acceptable variance between maximum dry density results has shown to be approximately ± 2%.

Nuclear Density Gauge

Only an Authorized Density Tester (operator) is to operate a nuclear device. Authorized Density Testers must complete training, hold a valid radiation dosimeter badge issued by the Materials and Testing Section, and must have a Nuclear Device Operator's license authorized by the LTRC

Training Section. The radiation dosimeter badge must be worn at all times when transporting, handling, or operating a nuclear device.
Regardless of ownership, each nuclear device used for acceptance testing on a DOTD project shall be approved by the Materials and Testing Section prior to use, and every two years thereafter. This approval includes the evaluation of calibration checks and leak tests. Leak tests are to be performed every six months.

When asphalt cement or other asphalt materials are present and a nuclear device is used to determine in-place density, the moisture content used to determine the dry density shall be obtained by either stove or oven drying, in accordance with DOTD TR 403. When discrepancy occurs between a moisture content obtained with a nuclear device and a moisture content obtained in accordance with DOTD TR 403, the moisture content obtained in accordance with DOTD TR 403 shall be utilized to determine in-place density.

Soils or soil aggregate mixtures which contain reclaimed asphalt concrete, recycled Portland cement-concrete, cement, lime, fly ash, coal, mica bearing clays, gypsum (calcium sulfates), phosphates or organic matter may cause erroneous moisture readings. Soils or soil-aggregate mixtures containing these materials will require the determination of their actual moisture content in accordance with DOTD TR 403. When a nuclear device operator encounters results that are obviously outside the normal pattern, moisture content determinations shall be performed to identify if an erroneous moisture reading is the cause of the unusual test results. When such a situation occurs, contact the District Laboratory Engineer.

Other Laboratory Equipment

Testing equipment used by the contractor or producer shall be independently certified every ninety days. Equipment that does not normally reside in the plant laboratory (equipment imported for each operation), the LADOTD certified inspector will need to approve the equipment prior to its use through inspection and calibration checking. Any testing equipment not available at the plant during the certification inspection shall be calibrated by an approved independent service prior to use.

PERSONNEL TRAINING AND CERTIFICATION

The successful completion of all prerequisite training materials is required whenever certification of personnel is required by the specifications. It is imperative that inspectors and QC technicians be thoroughly familiar with Department specifications, policy and procedural documents, and sampling and testing procedures. The project engineer or the district laboratory engineer will approve DOTD QC technicians on the project. Likewise, the contractor will approve their own QC technicians however; both Department and contractor technicians must be certified through the Department.

Each equipment operator shall be fully knowledgeable of the safety features, limitations, and uses of the machine. The contractor shall require that personal safety equipment be used as appropriate, including the wearing of radiation dosimeter badges by nuclear device operators. Personnel employed by the contractor to operate equipment shall be properly trained in its operation and be capable of using the equipment to ensure compliance with specification requirements. For example, motor patrol operators shall know how to maneuver the machine and position the blade to obtain a cut that uniformly conforms to grade for the full width and length of the area being shaped. Each operator of compaction equipment shall understand the relationship between the compactive effort of the machine in terms of speed, weight, vibratory impact, number of passes and the material being compacted. It is critical to the proper compaction of soils that compaction equipment be properly operated. Failure to operate compaction equipment properly may cause earthwork not to meet specification density requirements.

GENERAL CERTIFICATION REQUIREMENTS

Basic certification requirements and procedures are published in *The Administrative Manual for Construction Technician Training and Certification*. Certification is awarded by the Department upon satisfactory completion of all requirements, including six months on-the-job training in all phases of the certification area, successful completion of required training courses, and successful completion of certification testing. Arrangements for enrollment in the certification program and testing are made through the LADOTD district training office. The DOTD Materials Engineer Administrator is the certifying authority for the Department. He has full authority to grant or to revoke certification. Any individual certified under this program who is performing substandard work will be removed from the project and is subject to having certification revoked. Proceedings to revoke certification can be initiated by the district training specialist, district laboratory engineer, project engineer, or area engineer and will be processed in accordance with current Department procedures.

CERTIFIED PERSONNEL

Department

A certified DOTD inspector is required to be present at the jobsite during all phases of construction.

Certified inspectors are official representatives of LADOTD. They have the authority to accept or reject materials and project construction and have the responsibility to discontinue operations whenever the project does not meet Department standards or when improper construction practices are employed.

The certified inspector is responsible for ensuring that the contractor's materials and production meet the requirements of the LADOTD quality assurance program and conform to all requirements of the contract, plans, specifications, and Department policies.

Nondepartment

The contractor is required to provide a certified Soil and Base Course Technician when central plant mixed Class I Base Course (Standard Specification Section 301) is being produced for the Department. This individual shall be present at the plant at all times when production is in progress.

The certified Embankment and Base Course Technician is responsible for the contractor's quality control program and shall organize a sampling program and perform tests as established in the specifications, this manual, and other Department publications. The contractor's certified technician is also responsible for identifying the causes of deficiencies in base course production or operations and making the appropriate adjustments to bring the product into conformance with DOTD requirements.

For Class II Base Courses, In-Place Stabilized Base Courses, Embankments, Lime Treatment, and Treated Subgrade Layers, without central plant mixing, the contractor is responsible for ensuring that the person in charge of quality control is knowledgeable about LADOTD requirements. The contractor’s QC representative must be experienced in the area of construction, capable of overseeing operations and performing tests in accordance with LADOTD standards to construct a project meeting all specification requirements. When the contractor elects to use a central mix plant for Class II Base Course, all specification requirements of Class I Base Course, including the use of a certified Soil and Base Course Technician, will be required.

QUALITY ASSURANCE/QUALITY CONTROL

QUALITY ASSURANCE

The concept of quality assurance refers to the combined efforts of the contractor through quality control and the Department through inspection, verification, and acceptance to produce a project that will provide the public with a durable product exhibiting an intended level of performance. To this end, a system of inspection by qualified personnel (both Department and contractor) and statistically based sampling and testing has been established. Statistical specifications require random sampling. To ensure the Department's quality assurance program acquires information as intended, guidelines set forth in DOTD Designation - s605, *Using Random Number Tables* are used. The s605 - *Using Random Number Tables may be found* on the DOTD Materials Lab website under the Materials Sampling Manual Specifications – Sampling Procedures section.

The contractor's role is clearly to construct quality into each phase of a project. At the end of a construction phase, through the statistical sampling, testing and visual inspection program, the Department can only establish the level of quality already constructed. The Department has no part in the construction of quality, only quantifying the results.

The district laboratory engineer is the coordinating authority of the district's quality assurance program and is the legal representative of the Department in the area of materials quality as a direct representative of the DOTD Materials Engineer Administrator. The district laboratory is responsible for assuring that the quality assurance program is applied uniformly. The district laboratory has specific and implied responsibilities, including but not limited to the following:

- Administer the district Quality Assurance Program
- Certification and inspection of central mix plants
- Certification or approval of testing equipment
- Assisting and providing expertise for construction materials processes and problem solving
- Establishing the *Project Sampling Plan*
- Identifying the appropriate test to be performed

- Identification of proper sampling and testing techniques
- Interpretation of test results
- Sampling and approving project material sources
- Acceptance testing for selected parameters
- Project Materials Certification (2059 Review)
- FHWA mandated Independent Assurance Sampling and Testing
- Mix Design Approval

QUALITY CONTROL

At the preconstruction conference, the project engineer is to review the contractor's proposed QC program and provide a copy to the district laboratory engineer. The project engineer may require the contractor to modify the proposed program either at the preconstruction conference, before construction begins, or during construction. During construction, based on good construction processes and no failing acceptance test results, at the request of the contractor, the project engineer may allow a reduction in the number of tests required in the approved QC program, but not less than the minimum required by specifications.

When acceptance inspection or tests indicate that the contractor's QC program is not effective, modifications to the program will be required. The project engineer has the right to require changes in personnel, equipment, construction methods, testing methods or frequency. **The contractor will not be allowed to proceed with construction operations without an effective, approved QC program.**

The contractor shall locate, select, place and process uniform materials meeting specification requirements. The contractor shall sample and test the materials and final product to ensure that no failures will be identified by the Department during inspection or acceptance testing. Prior to the preconstruction conference, the contractor is to provide the project engineer with a list of qualified quality control personnel, their assigned responsibilities, and any prior experience in their areas of responsibility. Additionally, and still prior to the preconstruction conference, the contractor is to provide a list of the types of equipment proposed for the various construction activities, a proposed quality control program, and a basic schedule of sampling and testing that

includes the type(s) of testing equipment to be used. If the contractor is unable to provide details at the preconstruction conference, these topics are to be thoroughly discussed. The contractor will not be permitted to begin construction until the project engineer approves this information. If changes to personnel or any other aspect of the QC program must be made, the contractor shall notify the project engineer immediately.

PLANT OPERATIONS

The contractor shall perform tests in accordance with the Materials Sampling Manual to ensure that the plant continually operates within specifications.

When separate materials are being blended to meet specification gradation, the contractor shall perform gradation testing on the composited material. The contractor shall perform tests for moisture content in accordance with DOTD TR 403. Tests shall be performed on material in stockpiles and on the blended material discharged from the pugmill. The contractor shall check the percent cement being incorporated into the mixture at the beginning of each day's operation and at least four additional times each day. The results of these tests will be compared the *Base Course Design for Central Plant Mixtures* for conformance to tolerances.

It is the intention of the Department that the design percent cement be incorporated into the material. Although there is no payment adjustment for material with cement in excess of the design percent, such material with cement quantities more than 1% over required percent is not to be sent to the project site. The values for optimum moisture content will not be valid for extra cement; therefore, compaction problems may develop. If the contractor elects to add more cement than the design percent, additional testing must be performed to determine the optimum moisture content. **The additional cement shall not exceed 1% by weight; however, up to 1% more than design percent is acceptable**.

The contractor shall check the percent pulverization of the blended material discharged from the pugmill at least twice daily. The percent pulverization shall be checked in accordance with DOTD TR 431. Because of the two-hour time limit for the completion of soil cement placement

and compaction, **stop and go operations will not be allowed**. Plant operations shall be discontinued early enough in the day to allow the completion of final finish and application of the curing membrane at the end of the day's operations.

The *Materials Sampling Manual* publishes the official Department sampling and testing schedules for construction materials. In addition to formal sampling, these requirements include the Approved Materials List (AML), certifications, and visual inspections. The contractor or material provider is to refer the *Materials Sampling Manual* for the minimum acceptable QC Sampling and Testing requirements.

The Department may require additional sampling and testing when needed to ensure the quality of the product. The contractor may elect to perform additional sampling and testing to ensure the quality of the product prior to Department acceptance testing and inspection.

Sampling and testing requirements for materials or processes specified in Supplemental Specifications or Special Provisions are not included in the *Materials Sampling Manual.* If no sampling or testing requirements are published, sampling and testing will be as directed by the DOTD Materials Engineer Administrator.

NOTE

The contractor shall obtain copies of appropriate Department manuals needed for the work. Such documents may include specifications, plans, contract, *Materials Sampling Manual*, *Testing Procedures Manual*, "*Quality Assurance Manual*," etc. for the field representatives on the project. The contractor is to contact the District Training office for information on how to obtain these documents.

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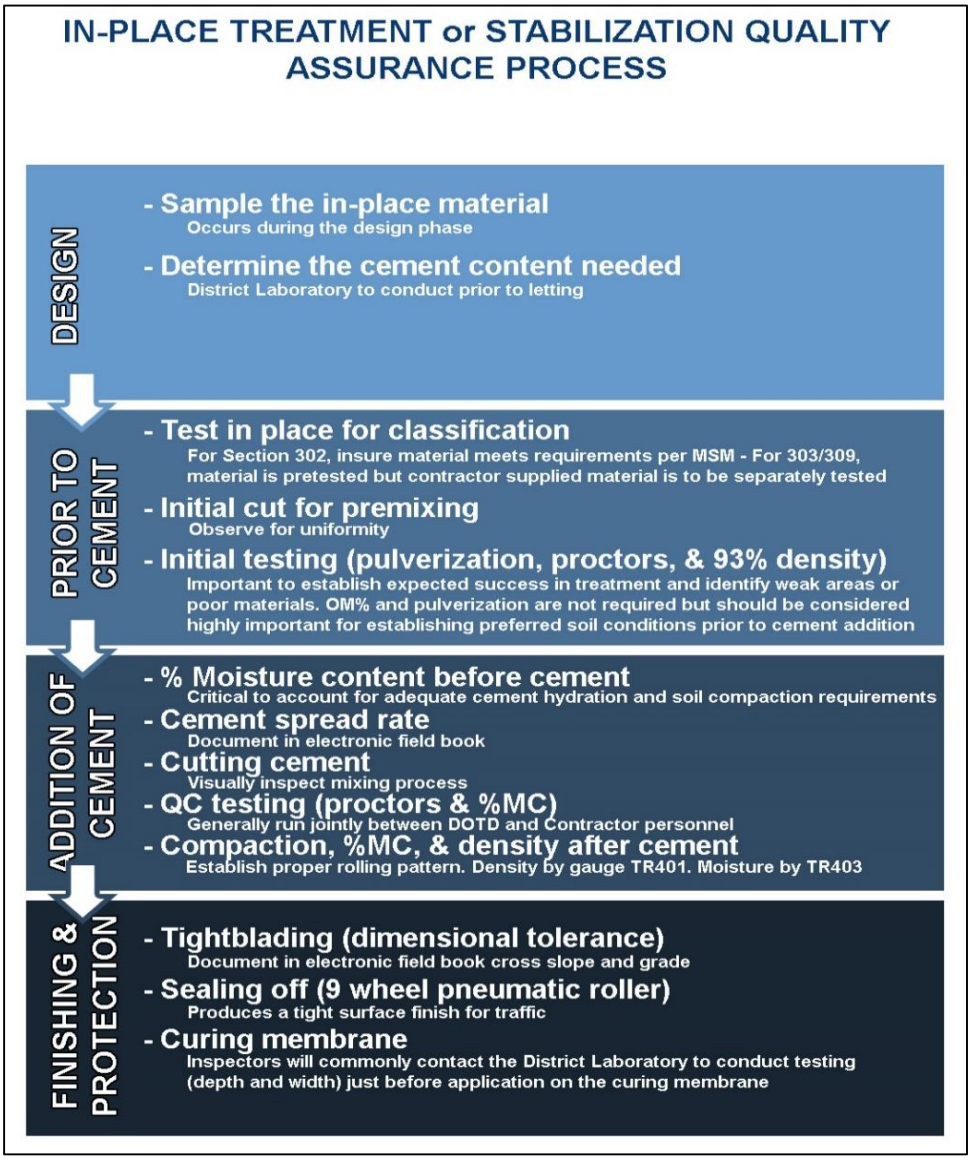
Evaluations of the QC effort to ensure that additional failing acceptance tests do not occur may include, but not be limited to, the following:

- Observation of construction procedures for uniformity of effort and results
- Observation of the contractor's sampling and testing procedures for conformance to Department procedures and proper testing techniques
- Evaluation of the contractor's testing equipment for proper working condition and conformance to the requirements of the appropriate test procedure

As there are varying levels of experience and application for methods for inspection and acceptance of the in-place cement treatment/stabilization process in the field, detailed process of the LADOTD QA requirements are described in the graphic.



CONSTRUCTION PRACTICES

CONSTRUCTION LAYOUT

Construction layout is the sole responsibility of the contractor and shall be established and maintained in accordance with Standard Specification Section 740.

TRAFFIC CONTROL

It is the responsibility of the contractor to control traffic. This includes installing signs and other warnings, as well as any traffic control devices that meet *MUTCD,* DOTD, and any other applicable requirements, all in accordance with the plans. The project engineer is authorized to require additional traffic control, as needed, in accordance with the *MUTCD*. It is also the responsibility of the contractor to maintain all control devices in good condition. If traffic control is not adequate or if signs or devices lean, become damaged, misplaced, dirty, or lose reflectivity, the contractor shall correct the deficiency immediately.

The contractor shall employ a Traffic Control Supervisor (TCS), and may employ as many Traffic Control Technicians (TCT) as needed. The TCS will be responsible for the installation, documentation (via traffic control diary) and maintenance of adequate control devices and placement for the project as detailed in Standard Specification Section 713.

Operations will not be allowed to proceed if traffic control is not effective. Corrections are not to be delayed, since the safety of the traveling public is of prime importance.

When local or through traffic is allowed, the contractor shall develop a system of control that will minimize the movement of cement on the surface prior to mixing. This proposal will require the approval of the project engineer. When possible, traffic is not to be allowed to traverse the unmixed cement. If traffic displaces cement, a uniform spread shall be redeveloped prior to blending with the in-place mixer. When traffic is maintained, the contractor shall control the

operation to maintain the free flow of traffic through the project. Equipment shall not obstruct the steady flow of traffic.

Project personnel will inspect traffic control daily and will monitor its effectiveness continually. Nighttime effectiveness of traffic control arrangements and their continued reflectivity will be regularly inspected after dark. Inspections will be documented electronically in Site Manager or on the Project Diary (DOTD Form 03-40-3093). Any deficiencies noted during inspections or during operations are to be documented along with instructions to the contractor regarding corrections. Follow-up inspections of the contractor's corrections are also to be documented. If the deficiency creates a dangerous traffic situation or is detrimental to the course being constructed, the engineer will require immediate correction or the discontinuance of operations until the deficiency is corrected. The contractor shall repair damage caused by any deficiencies.

CONSTRUCTION DETAILS

Construction details, both plant and roadway, for asphalt concrete and Portland cement concrete must meet the requirements of the appropriate Standard Specification Section(s), 502, 706, or 901 as outlined in the Quality Assurance Manuals.

WEATHER LIMITATIONS

Both contractor and Department personnel need to be constantly aware of weather conditions. For all base courses, when inclement weather is predicted, the contractor is to monitor operations to prevent material from being shipped to the jobsite when weather conditions will prohibit its use. If the material cannot be maintained within the specification range of optimum moisture content due to weather conditions, production or placement of the material will not be permitted. Additionally, the contractor should not produce mixture during borderline weather conditions that may have a detrimental effect on construction operations or materials. When scheduling operations, the contractor and the LADOTD representative are to consider such factors as length

of haul, speed of placement, compaction and finishing, current temperature and weather, past weather conditions (e.g., standing water, wet subgrade or stockpiles, excessively dry conditions, etc.), or predicted weather changes (e.g., approaching weather fronts, winds, temperature changes, rain, changes in humidity, etc.).

The specifications prohibit the production or placement of Base Course when the subgrade or stockpiles are frozen or when raining. In the case of cement treated Base Course, when the ambient temperature is less than 35°F or the temperature from the nearest weather forecasting station is to be 25°F or less within the 24 hour period following placement, production or placement will not be allowed.. Weather information is available from the National Oceanic and Atmospheric Administration (www.NOAA.gov). Ambient temperature is determined in the shade, at the jobsite, away from artificial heat. It is imperative that these conditions do not occur during production or placement throughout the extent of operations for the day.

If, despite precautions for inclement weather, rain falls on freshly spread cement or base material mixed with cement prior to the completion of compaction, the inspector will document the affected area. Immediately after completion of compaction, new moisture content tests will be taken for information after rain to determine if the material is within the ± 2% specification tolerance of optimum moisture. After seven (7) days, the area will be cored and tested for percent cement and strength. If the area does not meet design requirements, the area shall be restabilized or retreated in accordance with the specifications at no direct pay.

PULVERIZATION

Soil cement mixtures shall be pulverized until specification requirements for pulverization are met; however, the time limit for mixing and compacting shall not be exceeded. The Department will test for pulverization conformance to specifications after the addition of cement and water and prior to compaction. **It is advantageous for the contractor to ensure pulverization requirements will be met during in-place mixing while shaping, blending, and compacting to 93% density before any cement is spread.**

SPREADING CEMENT

When required by the plans or by the engineer, cement shall be spread from transports through approved, calibrated, mechanically adjustable spreader boxes. The spreader box shall be adjusted to provide a uniform coverage at the cement spread rate determined in accordance with DOTD TR 436. In addition to a stringline for alignment guidance, the contractor shall define the edge of cement spread on each side of the roadway by a stringline or other method approved by the engineer. The coverage shall be uniform for the full width of the roadway and the full length of spread for a transport. The appropriate length of spread for a transport will be determined in accordance with DOTD TR 436. If traffic displaces cement, a uniform spread shall be redeveloped prior to blending by the in-place mixer. In no case shall less than the minimum required percent cement be spread.

It shall be the responsibility of the contractor to check the spread rate and length of spread for each transport to be certain that at least the minimum cement factor is being met. The contractor is to provide these values to the project engineer for approval. No cement is to be placed until the spread rate and length of spread have been approved.

IN-PLACE MIXING

Material is to be mixed for the full depth and width of the base course. The number of passes needed for adequate blending may vary based on differing material classifications and moisture contents and additives.

For cement treatment, it is recommended that mixing be done in at least three passes of the in-place mixer. No water shall be added during the first pass, which will accomplish blending and pulverization. If needed, water shall be added through the in-place mixer during subsequent passes to bring the moisture content within the ±2% range of optimum. Additional passes shall be made as needed to achieve a uniform blend of base material and cement at a uniform moisture content. Moisture contents on the high side of the 2% range are recommended to make sure that the base is within the proper range at compaction after the addition of cement. When water is added to the base during mixing, it shall be added through the spray bar on the in-place mixer.

Water spray shall be uniform at all times; no clogged nozzles will be allowed. Specific spray nozzles may be disabled if necessary so that no overlap of water spray occurs between stabilizer passes. There are to be no dry areas between side-by-side passes of the in-place mixer. The cutting operation is to be slightly overlapped.

MOISTURE CONTENT

The contractor shall determine the moisture content of the individual base course section prior to spreading cement. Moisture content shall be determined in accordance with DOTD TR 403. **Moisture content determined with the nuclear device shall not be used for moisture control**. The moisture content of the section is to be adjusted during stabilization to ensure that the material is within the ± 2% of optimum at the time of compaction. If the moisture content of the section is excessive, the base is to be aerated until the material will meet these requirements. The three-hour time limit for the completion of placement, spreading, mixing, and compaction of the base must be considered when planning operations. Specifications require that compaction be completed within three hours of initial soil-cement contact; therefore, the time for aeration is limited. The three-hour time limit ends after final rolling for compaction. When the contractor must adjust the moisture content of the material to bring it into specification tolerances, the contractor shall back up operations and adjust the moisture content to meet specifications in deficient areas. It shall be the responsibility of the contractor to conduct additional moisture tests to determine the effectiveness of aeration. If the moisture content is too low, water shall be added through the in-place mixer to bring the base within the ± 2% tolerance.

When there is a question about moisture content, DOTD TR 403 will be used as the standard.

JOINT CONSTRUCTION

On soil cement base courses, transverse joints shall be formed by cutting back into the previous day's completed base course to sound material forming a vertical face for the total width and depth of the base course. The base course at the joint shall conform to the typical section shown on the plans. Fresh material from present construction shall be placed and uniformly compacted against the vertical joint face. All loose or broken material shall be removed from the joint area. Care is to be exercised to prevent joint areas from premature failure. Premature failure is a special problem at joints because they form a weakened plane in the base.

Transverse joint construction for bases composed of untreated or unstabilized materials shall be as directed by the engineer.

Cement treated base course shall be constructed for the full width of the roadway without longitudinal joints, unless specified or approved by the project engineer. When the construction of a longitudinal joint is approved, the joint area shall be trimmed to a vertical surface after compaction, but prior to final set. The longitudinal joint shall consist of sound, stable material, meeting specification requirements for base course density.

COMPACTION

For cement treated and stabilized bases, initial compaction shall be performed with a conventional sheepsfoot roller or a self-propelled tamping foot compactor type roller. The weight of the roller shall be adequate to achieve penetration for the full depth of the base course on the first pass and to achieve specification requirements for density. If bridging occurs or full depth compaction is not achieved, the contractor shall immediately adjust the operation or replace the equipment.

After initial compaction and rough shaping, it will be permissible to apply water uniformly to the surface if necessary to prevent surface drying. The addition of water will require the approval of the engineer. If the application of water to the surface is allowed, it shall be done with a manifold system that uniformly spreads the water across the path of the water truck.

Final compaction will be performed with a static pneumatic roller. The surface shall be left in a reasonably smooth condition with no laminations, corrugations, dips, or bumps. The compaction equipment shall leave the surface of the base course sufficiently above grade for the finishing equipment to achieve a proper, uniform grade and cross slope.

All compaction must be completed within the specified time limit or the base is unacceptable and construction processes will immediately be modified.

FINISHING

For cement treated and cement stabilized base courses, the surface finish of the base will be achieved using an automatic finishing machine. An erected stringline is required for Class I bases. Because curing membrane must be applied the same day as placement and compaction, the final finish must also be completed the same day as placement and compaction.

The specifications require that the manipulation (placement and compaction) of stabilized Class I Base Course be completed within two hours of initial mixing. Only final finishing, moist curing, and the application of asphalt curing membrane will be allowed on soil-cement after two hours. No traffic, including construction equipment (except equipment needed for the application of asphalt curing membrane), shall be allowed on the base course after two hours. Asphalt distributors used for the application of curing membrane shall not be large enough to damage the partially cured base course.

When time allows, low areas may be corrected using fresh material thoroughly blended with the in-place material by an approved in-place mixer meeting the requirements of Standard Specification Section 303, and then compacted and refinished. Any corrected area will need to meet the same specifications as an area that did not require correction during operations. Laminated areas or areas exhibiting waves, dips, or other deficiencies that cannot be corrected with the automatic finishing machine will be removed and replaced with fresh material in the same manner as low areas. Bumps and high areas may be corrected with the automatic finishing machine.

No manipulation of the stabilized base course will be permitted once three (two for Class I) hours have elapsed from initial mixing. When time does not allow correction before or during finishing, correction shall be made after the curing period and shall be by an approved method conforming to the requirements Standard Specification Section 301.

All corrections will require the approval of the engineer. Correction methods that may damage adjacent or surrounding base course or other construction will not be permitted. Areas in which an attempt is made to correct a deficiency, but for which correction cannot be completed prior to the time limit, shall be reconstructed in accordance with Standard Specification Section 301.

SCARIFYING AND COMPACTING

The contractor shall not scarify more than a mile of material in advance of compaction.

The contractor is to be aware of predicted weather and changing weather patterns and schedule operations to minimize the chance of getting pulverized and underlying materials wet. Damage to the roadway or materials prior to compaction shall be corrected at no direct pay.

It shall be the responsibility of the contractor to coordinate operations with the project engineer and the district laboratory engineer to obtain information needed for density testing in accordance with DOTD TR 415 or TR 418 and DOTD TR 401.

The scarified material shall be blended across the roadway to form a uniform mixture. Pieces of roadbed that cannot be adequately broken and blended shall be removed. The scarified and compacted roadbed shall be finished to a uniform, smooth, tightly knit surface. There shall be no undulations between stations. A prime coat shall be applied in accordance with Standard Specification Section 505.

COMPACTION – PIPES, MANHOLES, & BOXES

Compaction of backfill material by flooding will not be permitted.

Backfill placed in the haunch shall be compacted by positive mechanical means. This area will be inspected and approved by the engineer prior to the placement of the full lift. Areas that are inaccessible to conventional backfill compaction equipment shall be compacted by hand-held pneumatic tampers. Backfill shall be placed and compacted for each lift in the haunch area prior to the placement of the full lift until backfill reaches the midpoint of the pipe. Backfill shall be placed and compacted without disturbing the alignment or flowline of the conduit, especially lighter drainage units such as plastic or corrugated metal pipe.

When flowable fill is used, there are no compaction requirements. The material flows and consolidates under its weight while being placed at the appropriate consistency. However, the use of earthen berms creates a void that is difficult to compact under once the flowable fill has hardened. Care should be taken to place flowable fill against a vertical “form” face as best as possible to reduce poor compaction of soils around pipe or box culvert ends. Flowable fill is capable of floating large diameter pipes during placement. Methods to restrain pipes during backfilling may be needed.

Soil for Type-B backfill or selected soils shall be placed and compacted in lifts not to exceed six inches compacted thickness. Place Type-B backfill under all paved areas under traffic, at or near optimum moisture content in accordance with DOTD TR 415 or TR 418. Compact each layer by approved methods prior to the placement of a subsequent layer. The engineer will approve that the compaction method, including moisture control, will achieve at least 95 percent of maximum dry density in accordance with DOTD TR 401. Density testing on subsequent backfill layers may be waived by the engineer if performance has been satisfactory.

Excessive compaction may result in damage or deflection of the pipe. Additionally, insufficient compaction may allow the pipe to deflect once loaded with the surfacing. Therefore, proper compaction is most important.

ENVIRONMENTAL CONCERNS

Activities that negatively impact the environment potentially exist on every construction project. There are local, state, and federal guidelines that control these activities to minimize environmental harm. The contractor shall abide by these regulations and is to take every step necessary to prevent damage to the environment.

HAZARDOUS MATERIALS

When contaminated soil, underground storage or fuel tanks, friable asbestos, or contaminated fluids are encountered, the contractor shall immediately stop all construction activity in the vicinity and contact the Environmental Unit of the LADOTD Materials and Testing Section. The Materials and Testing Section will provide a cleanup plan for the contractor to follow. All coordination of activity surrounding the hazardous site will be through the Materials and Testing Section. The contractor shall follow the cleanup plan and guidance provided by the Department.

Prior to the contractor's operations, the project engineer or certified inspector is to inspect the area to be cleared and grubbed for evidence of hazardous materials, both surface and subsurface. Evidence of subsurface hazardous materials includes dying vegetation, abandoned or discolored soils, odors, abandoned disposal containers (e.g., 55-gallon drums), cattle dipping vats, garbage dumps, standing liquids (other than water), and powdery residues. If such items are present or the history of the area leads to concerns about the presence of hazardous waste materials, the project engineer is to contact the Materials and Testing Section's Environmental Unit. No work is to begin until a complete evaluation has been made and any hazardous materials removed. If evidence of hazardous materials is uncovered during clearing or grubbing operations, operations in the immediate area shall be stopped at once. The project engineer is to contact the Environmental Unit of the LADOTD Materials and Testing Section. Operations shall not be restarted in the area until an evaluation has been completed and any hazardous material removed. If no hazardous materials are located during the LADOTD evaluation of the site, operations may restart when the project engineer receives a release from the Environmental Unit of the LADOTD Materials and Testing Section.

Inspection for hazardous materials is to continue throughout all excavation activities. If evidence of hazardous materials is uncovered at any point during construction, activity in the area shall be discontinued immediately. Construction shall not be resumed in the affected area until all contamination has been removed and a release received from the Environmental Unit of the Materials and Testing Section.

Hazardous materials are to be removed from the project right-of-way and disposed in accordance with Standard Specification Section 202.

EROSION AND POLLUTION CONTROL

During the construction of roads and bridges, every effort should be made to prevent any movement of materials, contaminated or not, outside the limits of the project. Storm water can carry with it disturbed soil particles, as well as, residues from asphalts, oils, fuels, fertilizers, stabilizing chemicals such as cement, chemicals from the natural breakdown of certain aggregates, and has the potential for transporting many other materials hazardous to the environment.

Air can also be an efficient carrier of pollutants. Dusting is a major concern in the construction industry. Air can easily transport disturbed friable soils, lime, and cement dust, fines from manufacturing plants, volatile liquids, or smoke and ash from the burning of vegetation.
Vibration and noise are considered pollutants and environmental threats. Vibration from construction activity, such as pile driving and compaction efforts can be environmentally detrimental. Vibration can cause the damage to underlying soil layers, resulting in subsidence. Impact waves can cause structural damage and result in water table changes. Noise from construction sites can reach decibel ranges that affect the hearing of individuals.

Erosion control is critical on every project. The goal of erosion control is to ensure that no soil leaves the right-of-way or moves into any existing ditch, stream, pond, or other body of water. Pursuant to the Clean Water Act and the Louisiana Environmental Quality Act, a Louisiana Pollution Discharge Elimination System (LPDES) General Permit is required from the Louisiana Department of Environmental Quality (LADEQ) for any construction activity that disturbs five or

more acres. A Storm Water Pollution Prevention Plan (SWPPP) is required for these projects (refer to Page A-45 of the Appendix.) The SWPPP normally consist of: (a) the plan sheets indicating the locations of erosion control items, (b) Standard Plan EC-01, and (c) Standard Specification Section 204 (refer to Page A-43 of the Appendix for web addresses to locate LADOTD Standard Plans.) If there is no erosion control plan in the project plans, the project engineer is to contact the Headquarters Construction Section for an explanation. The SWPPP will be discussed at the Plan-in-Hand inspection.

To conform to the LADEQ mandate, the Department and the contractor are regarded as co-applicants for the permit to discharge storm water from construction activities. A **Notice-of-Intent** (NOI) form is submitted to LADEQ by the designer prior to the letting of the contract, and the approved permit must be posted on the project (refer to pages A 47 through 52 in the Appendix). Fines can be assessed by LADEQ for failure to comply with these regulations. The contractor shall be required to obtain a separate permit for pits, plant sites, or storage areas beyond the limits of the right-of-way. It is not the intent for LADOTD to pay for erosion control measures for pits, plant sites, or storage areas. Upon completion and final acceptance of the project, a **Notice-of-Termination** (NOT) form must be completed by the Project Engineer and submitted to LADEQ (refer to page A 55 in the Appendix.)

In accordance with Standard Specification Section 100, the contractor shall protect the project and adjoining properties from soil erosion and siltation by effective and continuous erosion control methods. These methods may require revision by the project engineer over the course of the project. The contractor shall respond to plan, installation, or maintenance of erosion control items issues from the project engineer immediately.

Weather conditions will not be considered an acceptable reason for any delay in maintaining erosion control.

The contractor is to provide qualified personnel to monitor erosion control on the project. To conform to LADEQ requirements, erosion control measures are to be inspected at least once every seven-calendar days and within 24 hours following the end of storm, that deposits 0.5 inch or more of precipitation. Seeded areas are to be checked regularly to ensure that a good stand of cover is maintained. Seeded areas are to be fertilized and reseeded as needed and in accordance with the contract. Sediment basins are to be cleaned at 50% capacity minimum.

Should erosion control fail, and soil be deposited outside the right-of-way, in accordance with Standard Specification Section 204, it shall be immediately removed and the surface repaired at no direct pay. Operations shall be discontinued until erosion deposits have been cleared and the area restored. Construction personnel will inspect erosion control measures regularly and after storm

The cost of maintenance, clean out, or removal of siltation for temporary erosion control features, such as but not limited to silt fencing and sediment basins will be included in the unit price of the respective item and shall be performed at no direct pay.
Proper installation along with continual monitoring and, most importantly, regular maintenance all together is the only possible method to maintain erosion control acceptably.

ARCHAEOLOGICAL OR PALEONTOLOGICAL INSPECTIONS

Prior to grubbing or excavation and continually during operations, the contractor, project engineer, and certified inspector are also to inspect the construction zone for areas of archaeological or paleontological significance or endangered plant or animal species, cemeteries, etc. Areas of archaeological or historical significance are those showing evidence of past civilizations. Such evidence would be burial grounds, isolated graves, building remains, pottery shards, arrow heads, Indian middens (rather small hill elevated above the surrounding surface, may occur in both hilly and coastal terrain throughout the state), or dark discoloration of the soil with visible artifacts. Middens may be composed of shell as well as soil.

Paleontological sites are areas where evidence of preexisting fauna or flora is located. Such evidence could be in the form of prehistoric animal fossils, or prehistoric fossilized plant remains. Fossils may be either the imprint of remains in soil or rock or the minerally replaced remains of preexisting life forms. If deposits of paleontological remains are uncovered, the contractor is to discontinue excavation and notify the project engineer. The project engineer is to notify the LADOTD Public Hearings and Environmental Impact Section and headquarters Construction Section. All work is to cease in the affected area until a proper evaluation has been made and the appropriate authorities have removed any significant finds.

Inspections for hazardous materials, archaeological and historical significance are also required for borrow pits. The contractor is to investigate the proposed pit area prior to any clearing, grubbing, or excavation. The initial investigation of these areas by the Department is the responsibility of the district laboratory engineer. The project engineer will receive a report of the laboratory findings regarding archaeological cultural or historical finds, in accordance with **EDSM III. 1.1. 22**. A reprint of the report form is on page A-19 in the Appendix. During construction, project personnel are to continue to inspect the material removed from borrow pits as it is placed on the project. Any findings shall be reported immediately to the LADOTD Materials Environmental Unit or Public Hearings and Environmental Impact Section, as applicable. The excavation of the affected borrow pit shall be discontinued until an evaluation has been made.

ACCEPTANCE

The project engineer is the legal representative of DOTD for the administration of the contract and represents the Department directly as well as through the inspection staff. The Department is responsible for inspecting, sampling, and testing for acceptance; the process of acceptance is ongoing. The Department evaluates the contractor's construction process, materials, personnel, equipment, and quality control program to determine if specifications are being uniformly met. Additionally, the Department takes samples and conducts tests to ensure that the contractor's QC test results are accurate and reflect the actual quality of the product. **The LADOTD results are used to determine the acceptability of the product and take precedence over any other test results.** The contractor shall correct any deficiency identified by the Department through inspection, sampling or testing at no direct pay. **Consistent or repeated failures identified by test results or repeated deficiencies identified by inspection will result in the suspension of operations until the cause is identified and corrected and the QC program is reviewed and modified to eliminate such repeated or consistent failures. Generally, the failure of a single check sample when compared against the initial deficient acceptance result is suitable to establish the undesirable nature of a material.**

SAMPLING AND TESTING

Construction personnel must be aware that soil classifications and conditions are subject to change, even within close proximity to borings. The Department will perform additional testing at the project engineer's request.

Acceptance sampling and testing is to be performed by Department personnel independent of the contractor's QC program. Under no circumstances is the inspector to use the results of the contractor's QC tests for acceptance results.

Materials will be sampled and tested for specification compliance in accordance with requirements for each type of material.

The contractor is not to wait until a change in materials or a test result from DOTD indicates a deficiency, but is to stay continually abreast of construction progress and activity. When

the contractor identifies failing materials or processes, the contractor shall take whatever measures are necessary to correct the deficiency and prevent its recurrence. These measures shall include, but not be limited to the following:

- Removal of personnel or equipment not performing in an acceptable manner
- Removing and replacing materials
- Locating and selecting other material sources
- Reprocessing the deficient area
- Additional testing both to establish the total limits of the deficient area and to ensure that corrective action has been successful

SAMPLING AND TESTING

Visual Inspection

Visual inspection is the most important part of the LADOTD quality assurance program. Acceptance testing can only demonstrate the values at a single sampling location. The department relies on visual inspections to compare and accept a much larger segment of production**. When deficiencies, such as nonuniform materials or nonuniform processes, result in areas that do not appear to be acceptable or which are obviously not in conformance with the quality of construction expected, are identified by visual inspection, they must be corrected, regardless of the results of the routine acceptance tests, before the section can be accepted.**

Such deficiencies for earthwork and base course construction may include soft spots, pumping, nonuniform gradation/pulverization/blending/moisture content of materials, failure to stabilize, laminations, waves, or undulations in the surface, varying width or depths, rutting, movement under traffic, etc.

It has never been the intent of the Department to accept a project solely based on the statistically based sampling and testing program. It is always necessary for the project engineer and inspector to be aware, especially through visual inspection, of the quality of

construction and performance of the project during construction and acceptance phases before final acceptance.

SAMPLING AND TESTING

Embankments

Sampling and testing verifies the question initiated by visual inspection. Project personnel will sample and test material for acceptance in accordance with the *Project Sampling Plan*, based on the schedule published in the *Materials Sampling Manual*. It is to be noted that the *Materials Sampling Manual* establishes the minimum required level of sampling and testing. The engineer has the authority to require additional tests to ensure uniformity, acceptability, and quality of the work. When samples or tests yield failing results, the Department will require the contractor to correct the area (represented by the sample or test), unless the specifications allow the application of payment adjustments. **Materials are to be sampled, tested, and approved prior to incorporation into the project. Materials that do not meet specifications are not to be placed.**

Prior to placement, all soil will be sampled, tested, and approved for use. During the placement of embankments, project personnel are to check the thickness of each lift at random locations to ensure that the maximum loose thickness per lift is not being exceeded. For cuts, project personnel will check the top layer to ensure that it has been prepared to the correct depth and width and compacted to at least the minimum density required by the specifications.

The Department will test the material for moisture content during processing prior to the beginning of compaction. If the material is not within the specification tolerance of [-2.0 to +4.0]; the contractor will be required to reprocess the material before beginning compaction.

Moisture content obtained by nuclear device during density testing is not allowed for this process.

The section must meet the inspector's approval prior to acceptance density being performed. The inspector is also to check the section for alignment, grade, and cross slope prior to final acceptance of the section.

If a proctor is to be used to determine the maximum dry weight density, the material to mold the proctor is to be obtained from underneath the nuclear device at the location where the density test is taken. If a sand cone is used in place of the nuclear device, the material for the proctor is to be taken from the material surrounding the hole.

Embankment Zones

Before the contractor begins operations, the project inspector, in conjunction with the district laboratory and the engineer, will establish 1000-foot sections for quality control and acceptance. It is to be noted that bridges, exceptions, and equations are not to be included in the continuity of 1,000 feet. All sections are to be approximately 1000 feet in length, with the exception of the first and last sections, which may vary between 750 and 1250 feet in length. Section lengths will be measured and reported to the nearest foot and be delineated by station numbers and sketches, as needed. These sections will be used for all acceptance measurements and testing, including density and DOTD TR 602.

Base Courses

Samples and tests for optimum moisture content, actual moisture content, or density will not be taken until the material is blended thoroughly and to the satisfaction of the inspector.

After the base material has been uniformly blended and compacted and the roadbed shaped to cross slope and grade, the density is to be checked in accordance with DOTD TR 401. The density of the untreated base must meet a minimum of 93% of maximum dry weight density. This initial compaction will help to ensure that uniform base course depth is maintained, grade and cross slope requirements are met prior to stabilization, and that final compaction deficiencies are

minimized. **No cement shall be spread until all deficiencies are corrected and this density requirement is met.** Density will be checked once per each 1000 linear feet of roadway and once per each 2000 linear feet of shoulder.

Pipes, Drainage Structures, and Boxes

When density for pipe or structural backfill is a requirement, the project engineer will ascertain that the compaction and moisture requirements are met. The project engineer will take as many tests as necessary to ensure that each layer of backfill material meets the density requirements.

Quality Control (QC)

The contractor is to document all quality control testing and provide copies to the project engineer as directed. The contractor shall stamp all QC documents "QC" with red ink, in minimum one-inch high letters. The contractor is to complete QC testing and make any needed corrections prior to requesting acceptance testing by the Department.

DIMENSIONAL TOLERANCE

Thickness, width and cross slope are to be documented in an electronic field book.

Grade and cross slope of the finished base course will be inspected for acceptance by project personnel at locations and at a frequency determined by the engineer. Areas not in conformance with the specifications will be isolated and correction will be required.

Project personnel will measure the thickness and width of the base during construction in accordance with DOTD TR 602 to verify the contractor's QC and will document these measurements in an electronic field book set up for thickness and width measurements. Areas not in conformance with specification tolerances for plan thickness or width are to be isolated and corrected. To isolate a deficient area, move up and down station five feet and retest. Then, test at 25-foot intervals until the limits of deviation from specification tolerance are identified. The

district laboratory will inspect thickness and width in accordance with DOTD TR 602 for final acceptance. The district laboratory engineer will notify the project engineer of areas that do not meet specification requirements. The project engineer will require the contractor to correct these areas. Additional thickness and width measurements will be taken by the district laboratory as necessary on the corrected areas prior to final acceptance. If the contractor elects to correct a deficient area by restabilizing or retreatment, the district laboratory engineer will determine a new cement content and optimum moisture content.

COMPOSITE BASES

The Department will occasionally design a base comprised of both cement treated soil and aggregate layers. The contractor may also request a change order for a smaller thickness of stone base into a thicker section of soil cement for various economic or logistical reasons.
The resulting layer is perfectly acceptable for the Department, given a review by the Pavement Design Engineer, but the revised dimensions may prove more difficult to track and document in the field for the purposes of payment and meeting minimum testing requirements.

When thickness and width measurements are taken by either the contractor's QC personnel, project inspectors, or the district laboratory, the locations for measurement must be at the same location from the centerline and station. The individual thickness and width tolerances, the impact to percent cement in a base course from over width or over thickness blending, and grade control must all be considered when measuring a composite base course.

When crushed stone base or recycled concrete base is used over soil cement base, the individual base layer tolerances shall be as in Table 302-2, and the total base course under-thickness shall not exceed 1 inch (25 mm).

MEASUREMENT AND PAYMENT

DEDICATED STOCKPILES

A dedicated stockpile is defined as a stockpile built for a specific project. It is sampled, tested, and approved during its construction. Dedicated stockpiles are to be constructed in final position. Material in dedicated stockpiles may be used only on the project for which it has been dedicated, unless otherwise approved in writing by the project engineer. Once the Department has approved a dedicated stockpile, no material can be removed or added without the approval of the project engineer.

During the construction of a dedicated stockpile, the engineer will sample the stockpile in accordance with the *Materials Sampling Manual* and submit the samples to the district laboratory for testing. It shall be the responsibility of the contractor to notify the project engineer and request sampling and testing during stockpile construction and to keep the project engineer and district laboratory engineer apprised of the building schedule of stockpiles to be dedicated.

ACCEPTANCE WITHOUT PAYMENT ADJUSTMENT

Acceptance criteria other than payment adjustments apply to Class I Base Course. If the section does not meet specification requirements for depth, width, grade, cross slope, percent moisture at compaction, pulverization, or other deficiencies identified through visual inspection, the deficiency must be corrected by the contractor at no direct pay in accordance with Standard Specification Section 301. Corrections must be completed, inspected, and approved in accordance with the timetable established by the engineer prior to the final documented acceptance of the course.

ACCEPTANCE WITH PAYMENT ADJUSTMENT

There are no cumulative payment adjustments in Standard Specification Section 302. The only specification requirement for acceptance with a payment adjustment is density of the completed base course. The contractor shall correct any other criteria and raw base course density that do not meet specification requirements before the base is accepted

Class I Base Course has payment adjustments attached for both percent cement and percent density per section. **These payment adjustments are cumulative for Class I Base Course.** Raw base has a payment adjustment attached for percent density per section. Payment for a section to which a payment adjustment is applicable for both parameters will be made at a combined adjustment in pay, as shown in the following example:

Percent Pay - Density:	**90%**	**(10% reduction in pay)**
Percent Pay - Cement:	**80%**	**(20% reduction in pay)**
Cumulative Reduction in Pay:	**30%**	

Therefore, payment for this section will be made at 70% (100% - 30% = 70%) of the contract unit price.

EXAMPLE OF CUMULATIVE PAYMENT ADJUSTMENT - PARTIAL SECTION (ROADWAY) AFFECTED BY CEMENT

When a deficiency in cement content for Class I Base Course causes production to be discontinued partway through a section, the percent payment for the section will be adjusted to reflect the failing portion for cement rate, as shown in the following example. When the payment adjustment is for insufficient density, the adjustment shall be applied to the entire section.

Percent Pay - Density:	**90%**	**(10% reduction in pay)**
Percent Pay - Cement:	**80%**	**(20% reduction in pay applies to 350 linear feet)**

Cumulative Reduction in Pay: 10% + 7% = 17%

Therefore, payment for this section will be made at 83% (100% - 17% = 83%) of the contract unit price.

REMOVAL AND REPLACEMENT OF BASE

Any failing section in the Class I or Class II Base Course will require documentation and a plan change for acceptance below the 100% payment level. The documentation will consist of the project engineer's statement of disposition of failing material to be incorporated in the 2059 Review.

When the payment adjustment for either density (or cement in the case of Class I) is in the 50% or remove category, the Department will investigate and may require that the material be removed and replaced. When removal is caused by failing density, the material shall be removed for the full width of the roadway for the entire length of the section. When removal is caused by failing

cement, the material shall be removed for the full width of the roadway for the entire length of the plant lot placed in the section.

When the cumulative payment adjustment for Class I is less than 50%, the entire section shall be removed and replaced with central mix processed material.

When the cumulative payment adjustment for Class II is less than 50%, the entire section shall be removed or re-cut at a cement content determined by the district laboratory.

PLACING BACKFILL

Furnishing and placing backfill material below existing ground level for pipes will not be measured for payment. Backfill material needed to complete backfill above natural ground and around pipes that extend above natural ground will be measured for payment under applicable earthwork items. When flowable fill is specified, measure for payment in accordance with Standard Specification Section 710.

201- Clearing and Grubbing

Clearing and grubbing is a surface operation for the cutting and removing of timber, logs, brush, stumps and debris within or encroaching onto the right-of-way. The term also covers excavating and removing stumps, roots, submerged logs, snags, and other perishable or objectionable material not covered under other contract items. The contractor is to identify the clearing limits of the project as shown on the plans and is not to operate outside of those limits.
Prior to the beginning of clearing or grubbing activities, the project engineer or the certified inspector is to inspect the area to determine if these activities are likely to cause damage or require access to adjacent private property.

Typical damage that may occur to adjacent properties includes cutting through tree roots, pushing excavated material onto adjacent lands, and damaging septic systems or public utilities.

Erosion may become a problem after ground cover is disturbed. The contractor is to install erosion control devices or procedures to protect the project limits, the environment, and private property. These operations shall be in accordance with the plans or as directed. For more details on erosion control, refer to **ENVIRONMENTAL CONCERNS – Erosion and Pollution Control in this manual, and Standard Specification Section 204.**

If damage occurs to private property during construction operations, the contractor is responsible for making restitution. If access to private property will be required, the contractor must obtain written permission from the landowner prior to operating on property outside the right-of-way. The project engineer shall not allow the contractor to operate on private property until a copy of the owner's written permission is in the possession of the project engineer.

The contractor is to check the location of all utility lines, both overhead and underground, prior to bidding and before beginning clearing and grubbing operations. The contractor is to call ***LA1 Call*** (811) or make other appropriate contacts before grubbing or performing any excavation in an area where utilities could be disturbed. When felling, topping or trimming trees, broken or cut limbs are not to fall on or damage overhead wires. Personnel climbing trees near overhead utilities are

to be trained in the appropriate safety precautions, and must exercise extreme caution when working near any overhead utilities.

Unless the area is to be further excavated, the contractor shall backfill holes left in the natural ground from the removal of stumps or other obstructions with usable soil conforming to Standard Specification Section 203 and compact the area to at least the density of the surrounding ground.

The specifications require that low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed. Branches of trees extending over the roadbed shall be trimmed to a height of 20 feet above the pavement surface. Trimming shall be accomplished by established practices published in the ANSI A300 Pruning Standard and in the Arborists' Certification Study Guide published by the International Society of Arboriculture (ISA).

VEGETATION ON PRIVATE PROPERTY

Representatives of both the contractor and the Department are to be aware that there are legal ramifications involved in trimming trees rooted on private property that overhang the right-of-way. The project engineer is to check the right-of-way agreements with reference to trees on adjacent property that may be affected by construction activity.

If a tree or any portion of a tree rooted on private property is dead or so severely damaged that it will be a hazard to the traveling public, that portion must be removed even without written permission of the owner. Should such a situation develop, the project engineer is to notify the Area Engineer. The LADOTD Right-of-Way Section, Construction Section, and Legal Section are to be notified before any cutting is performed.

The project engineer or inspector is to inspect the project area for any trees or other vegetation located on private property near enough to the right-of-way to be in danger of damage from construction activity. The situation is then to be assessed and appropriate arrangements made to prevent such damage or to compensate the property owner for the damage.

DISPOSAL OF EXCESS MATERIAL

The disposal of all cleared or grubbed materials is the responsibility of the contractor. Such materials must be removed from the right-of-way and disposed at locations off the project outside the limits of view of the traveling public. The disposal of such material shall be in conformance with all federal, state, and local regulations and Standard Specification Section 202. If the contractor does not own the disposal area, the contractor shall obtain a written agreement with the property owner allowing the placement of excess material on the property, and specify the type(s) of material to be disposed. The contractor shall provide the project engineer with a copy of this agreement with the property owner prior to the removal of any material from the right-of-way. If the contractor owns the disposal area, the contractor shall provide the project engineer with a letter indicating the location and ownership of the disposal area and relieving the Department of any responsibility.

Excess material is not to be buried within the right-of-way.

BURNING VEGETATION

The contractor may dispose of vegetation by burning. Submit a plan for burning operations to the engineer for review and comment. The burning of such material on the right-of-way shall be in accordance with all applicable laws and ordinances, including, but not limited to the current regulations of the Louisiana Department of Environmental Quality and Subsection 107 of the Standard Specifications. While materials are being burned, they shall be under observation by the contractor's representative. The burning of perishable materials shall not damage anything designated to remain on the right-of-way, surrounding forest cover or other adjacent property.

Burning of vegetation can take place only between the hours of 8:00 a.m. and 5:00 p.m. Material to be burned is to be stacked in piles that can be completely reduced during this period. All burning must be controlled so that no traffic hazard is created. The amount of dirt contained in the material being burned must be minimal. Materials that may produce unreasonable amounts of smoke, such as oils, asphalt materials, rubber tires, etc., may neither be burned nor used to

start a fire. Piles of material to be burned must be at least 1,000 feet (305 m) from any dwelling, other than a dwelling located on the property on which the burning is being conducted. Prevailing winds must be blowing away from any nearby town or city while material is being burned.

If the wind direction shifts while material is being burned, so that smoke will be blown toward a municipality or across a roadway, the fire is to be put out and not restarted until safe conditions are available. If material is to be burned on private property, the contractor is responsible for meeting all regulations. Regulations for burning material on private property may differ from those governing burning material within the right-of-way. Additionally, the contractor shall obtain a written agreement from the property owner giving permission for burning and stating the type and quantity of material(s) to be burned. The contractor shall provide a copy of this agreement to the project engineer prior to removing materials to be burned. If the contractor owns the property on which the burning will take place, the contractor shall provide the project engineer with a letter indicating the location and ownership of the disposal area and relieving the Department of any responsibility.

SELECTIVE CLEARING

Whenever any vegetation is scheduled to remain in-place, selective clearing techniques shall be employed. The Project Engineer's personnel are to clearly mark each tree, shrub or other greenery scheduled to remain on the right-of-way. The contractor shall notify the project engineer at least two weeks in advance of the planned beginning of clearing operations, so that all vegetation scheduled to remain can be flagged and an inspector made available.

Contractor's personnel are not to damage remaining shrubs, trees or their root systems during selective clearing or subsequent construction operations. Personnel must remember that tree roots extend at least to the limits of the tree canopy (drip line). Disturbing the ground under a tree, either by removing or adding dirt, or damaging the bark on a tree leads to a weakened condition from which many trees cannot recover. Repair damage to bark, trunks, limbs or roots of vegetation marked to remain using horticultural and tree surgery practices published by the American Association of Nurserymen (AAN) under the supervision of a licensed landscape arborist at no cost to the Department.

Any activity that may damage a tree's root system will be prohibited. Some common construction activities that can damage a root system are:

- Hitting trees or shrubs with equipment.
- Using heavy equipment over the roots, resulting in excessive soil compaction in the root area and/or damage to the roots.
- Placing soil around trees over the root zone.
- Exposing roots or disturbing their soil cover.
- Disturbing the vegetation's environment, altering water quantities or patterns.
- Spilling hydraulic fluids or any petroleum substance in the root zone.
- Disking in the vicinity of the roots of trees or shrubs when preparing soil for seeding operations.

There is a Roadside Development Specialist available to assist the project engineer in identifying and evaluating the condition of vegetation scheduled to remain on the right-of-way. The Roadside Development Specialist can also be of assistance in identifying activities that could damage vegetation.

QUALITY CONTROL

The contractor will keep detailed records of all activities, permits, correspondence, and related documents until the Department has accepted the clearing and grubbing as required by the contract and plans.

202 - Removing or Relocating Structures and Obstructions

Removal of structures and obstructions includes removing and disposing of anything not designated or permitted to remain on the right-of-way, except obstructions to be removed under other contract items. **Relocation of a structure** involves moving it to a new location specified by the Department and restoration to original condition with all connections properly made, all in accordance with the contract and plans.

Structures, pipes, culverts or other objects slated to be salvaged in total or in part shall be dismantled, handled and stored so that no damage will occur. If salvaged materials are to be stored on private property that does not belong to the contractor, the contractor must provide the project engineer with a copy of the written agreement made with the property owner. If salvaged materials are to be stored on property owned by the contractor, the contractor shall provide the project engineer with a letter indicating the location and ownership of the storage area. The agreement must contain language holding the Department harmless from any liabilities from the contractor or property owners. This agreement is also to designate the type(s) and quantity of material to be stored. If materials are to be disposed of such property, a copy of the agreements discussed under **CLEARING AND GRUBBING** must also be provided to the project engineer.

If the contract requires the contractor to deliver salvaged material to a DOTD location, the contractor and project engineer shall arrange for this delivery. A Department representative will be assigned to inventory the material to be salvaged and delivered, and to receive the material at the designated DOTD location.

Holes or other depressions outside construction limits shall be backfilled and compacted as directed by the project engineer. Holes left by structure removal, except in areas to be excavated, shall be filled to the level of the surrounding ground with usable soil conforming to Standard Specification Section 203, and shall be compacted as directed to at least the density of the surrounding soils. The filling operation shall be performed as directed in accordance with standard embankment construction procedures. Large cavities beneath the roadway or other structures are to be filled and compacted in lifts not exceeding 12-inches loose thickness, in

accordance with Standard Specification Section 203. When a bridge or other drainage structure used by traffic is slated for removal, operations are not to begin until arrangements have been made to accommodate traffic. Substructures in streambeds shall be removed to natural stream bottom. Parts of substructures outside of streambeds shall be removed to one foot below natural ground.

Objects such as trees, structures, culverts, pipes, etc., designated to remain on the right-of-way, or which are situated on private property adjacent to the right-of-way are not to be damaged during the removal of other objects. The contractor is responsible for any damage that occurs to objects that are not slated for removal. The contractor shall repair or replace any damaged object not slated for removal as directed.

QUALITY ASSURANCE DOCUMENTATION

Project personnel will document the removal or relocation of structures and obstructions in an electronic field book in accordance with standard Department practice. The contractor will keep detailed records of all activities, agreements, permits, correspondence, and related documents until the Department has accepted the removal and relocation as required by the contract and plans.

203 - Excavation and Embankment

EXCAVATION

Excavation is designed for shaping the project, including cut sections. It includes the excavation of materials, both usable and nonusable, and the disposal of excess or nonusable materials for which provision is not made in other specification items. Standard Specification Section 203 includes excavation for roadways, ditches, channels and structures, as well as all associated grading operations.

Undercutting is the removal of materials discovered during construction operations that are not suitable to be left in place. The Department will determine which materials are to be undercut. Undercut materials will be paid under general excavation.

Excavation for lateral drains or other activities outside the right-of-way may require access to private property. If it is obvious that the contractor's employees require access to property not owned by the Department, the project engineer must have possession of a written agreement from the owners of the property allowing access during construction. This agreement may be obtained by the Right-of-Way section prior to letting; it may also appear as a construction or drainage servitude on the plans. If such an agreement is not available, the project engineer will not allow the contractor to perform any work that requires access to adjacent property until written permission is obtained. It is the responsibility of the Department to obtain this agreement. The contractor will be provided a copy of the agreement. Prior to final acceptance of the project, the contractor shall obtain a written release from the property owner stating that the property has been restored to a condition that is satisfactory to the owner. A reprint of the Certificate of Release is on page A-9 of the Appendix.

DISPOSAL OF EXCESS OR UNUSABLE MATERIALS

The disposal of unusable excavated materials shall be the responsibility of the contractor. If these materials are to be disposed on property the contractor does not own, the contractor shall obtain a written agreement from the property owner, designating the type(s) and quantities of materials, to be disposed. A copy of this agreement must be provided to the project engineer before excavation operations begin. If excavated materials are to be stored on property owned by the contractor, the contractor shall provide the project engineer with a letter indicating the location and ownership of the disposal area and relieving the Department of any responsibility. This agreement is also to designate the type(s) and quantity of material to be stored.

DRAINAGE EXCAVATION

Drainage excavation is designed to remove water from the roadway area to natural drainage systems. It includes excavation for drainage beyond the limits of the roadway section, except for wing ditches at cuts. Wing ditches at cuts will be paid under general excavation. The contractor shall dispose of material from drainage excavation that does not conform to Standard Specification Section 203 in accordance with Standard Specification Section 202. If the contractor elects to use material obtained from drainage excavation in the embankment or in other project areas, it must be sampled, tested, and evaluated by the Department for conformance to Standard Specification Section 203.

EMBANKMENT

Embankment construction includes all work associated with the building of embankments for roadways, structures or other similar Department projects.

Earthen embankments must be constructed of usable soils, which may be obtained from excavation or borrow. All soil used in the embankment, regardless of source must be tested in its original location or in dedicated stockpiles by the district laboratory. Soils shall not be incorporated into the embankment until they have been approved for embankment use. Soil usage shall be as specified in Standard Specification Section 203

SOIL BORING INFORMATION

Plans provided by the Department may include the results of soil borings and the classification of soil materials within the right-of-way. **The Department does <u>not</u> guarantee the accuracy of such information to be representative of the entire project.** These borings are taken to establish the general character of area soils during the design phase of the project. They are not intended to provide detailed subsurface information for bidding or construction. **The contractor is advised to obtain independent samples and evaluate the subsurface material prior to entering a contract bid.**

BORROW (INCLUDING PIT SUBMITTAL PROCESS)

Generally, sources of material located outside the right-of-way will not be designated in the plans. When material sources are designated in the plans, the requirements of Standard Specification Section 106 will apply. When material deposits are not designated in the project plans or specifications, the contractor shall provide sources meeting the requirements of applicable sections of the Standard Specifications.

Sources of soil needed for construction and not available from excavation within the project are referred to as "borrow." The district laboratory engineer must approve borrow sources.

The contractor shall submit any request for sampling and testing to the project engineer a minimum of 30 calendar days prior to the anticipated date of needing borrow.

The project engineer will ascertain that the contractor has complied with all Department requirements before submitting the request to the district laboratory engineer. The Department will not act on any request until these conditions are met. **No material can be placed on any DOTD project until the Department has approved it.**

Borrow areas, which will result in a depression, must be located at least 300 feet from any public right-of-way. Borrow areas must be located at least 300 feet from the bank of a stream listed on the National System of Wild and Scenic Rivers or the LA Natural and Scenic Rivers System.

The request shall be in writing and shall include/identify:

- The location of the proposed source.
- The proposed depth and type of excavation
- A written agreement between the contractor and the property owner that allows Department personnel access to the property. This written agreement with the property owner shall state that the contractor has agreed to purchase material from the owner if the material is approved for project use. The contractor shall obtain a separate agreement allowing Department personnel access to property from each property owner whose property the Department must access. A reprint of the Right of Entry is on page A-7 in the Appendix. The contractor shall be responsible for clearing both the proposed site and access area to permit the easy entry of Department personnel and equipment. The contractor shall survey and stake all corners of the proposed borrow pit and establish a base line.
- A drafted, detailed survey plat.
- A general area location map with the location of the pit marked.
- Private laboratory results at the frequency detailed in the Materials Sampling Manual indicating acceptable anticipated results for the intended use. Under no circumstances will Private Lab results be recognized as a substitute for Department acceptance testing.

An example a Borrow Pit Sketch (survey plat) and Location Map are located on pages A-3 and A-5 in the Appendix.

PLASTIC SOIL BLANKET

When soils with a P.I. less than 10, or a pH less than 5.5, or greater than 8.5 are used in embankment construction, or form the final surface of a cut slope; the slopes of the embankment must be protected with a plastic soil blanket conforming to Standard Specification Section 203.

Soils with more plasticity (soils with a P.I. greater than 10 and a neutral pH 5.5 - 8.5) serve to inhibit erosion in cut or new fill locations and promote grass growth.

On slopes when the material has a P.I. greater than 10, but has a pH less than 5.5 or greater than 8.5, in lieu of placing a plastic soil blanket on the slopes, the contractor may treat the slopes to bring the pH into the desired range of 5.5 to 8.5. When the pH is above or below these values, the Roadside Development District Coordinator will be contacted to provide the appropriate treatment. The modified soil will be sampled by project personnel and tested by the district laboratory to determine the acceptability of the pH value.

The plastic soil blanket shall be placed in lifts of uniform thickness and compacted with a cultipactor. There shall be no low spots, voids, or lumps in the completed blanket. Plastic blanket material shall be evenly distributed. The minimum thickness of the completed blanket shall not be less than 12 inches.

NONPLASTIC EMBANKMENT

Nonplastic embankment is generally constructed over unstable areas subject to subsidence. They are constructed of aggregates with a surcharge lift that is removed after the required design time has elapsed. This surcharge is designed to consolidate the underlying unstable materials by dewatering and moving the particles closer together. It is critical when constructing nonplastic embankments that, as the material is being placed in lifts that the unstable materials underneath do not become intermingled with the specification aggregates. Such contamination will immediately cause the loss of support value that the design demands. Such areas shall be immediately corrected and construction operations modified to avoid any further occurrences.

Nonplastic embankments are constructed with sand, shell, stone, or blended calcium sulfate by mechanical equipment, first building a working table, then placing the aggregate in lifts. After building the working table to the satisfaction of the engineer and in accordance with the contract and plans, each lift shall be constructed in accordance with general construction requirements for embankments.

When Blended Calcium Sulfate (BCS) is used, certain chemical characteristics must be considered. Special test equipment and modified operations as listed on the next page are necessary while constructing embankment with this material.

- The material must be transported and processed in the damp state to avoid dusting. Dust from this material may create a hazardous air pollution situation.
- Place BCS in lifts not exceeding a thickness of 12 inches loose.
- When determining moisture content (TR 403) for moisture control and density testing, the sample must be dried for a minimum of 24 hours at 140°F in a forced draft oven. This material changes in characteristics when overheated; therefore, a lower temperature for a longer period must be used.
- This material requires a plastic soil blanket for environmental purposes and support of vegetation.
- The material cannot be placed within 10 feet of a metal structure due to corrosion potential.
- The material can be blended with an approved limestone or lime that will control the pH.
- The Materials and Testing Section must approve the quality control plan.
- All materials shall be from approved sources.
- Environmental clearance must be obtained from the Department of Environmental Quality.

STABILIZATION WITH GEOTEXTILE FABRIC

Areas of unstable foundations may require stabilization with geotextile fabric. This requirement will be shown on the plans. Geotextile fabric is designed to prevent the intermingling of usable embankment material with underlying unstable material. It helps distribute the load from overlying material onto a less structurally sound layer beneath. To be effective, the geotextile fabric must form a complete barrier. Therefore, it is critical that the fabric be protected from deterioration before and during placement. Ultraviolet damage, tears, failed seams, improper installation in curves, and other similar defects can lead to premature failure of the embankment.

QUALITY ASSURANCE (QA)

The specifications delineate different conditions, based on embankment height and type (fill or cut section), which regulate the preparation of the existing ground, placement and compaction of soil for an embankment.

The following table illustrates the complex details that personnel must be aware of to construct an embankment according to the LADOTD requirements. This table outlines the different situations and requirements for preparing the existing (natural) surface of the ground before actually starting embankment construction.

EMBANKMENT HEIGHT	PREPARATION
Fill	
< 5 Feet	Remove heavy sod & objectionable vegetation. Before usable material is placed, scarify existing ground to 9" depth. Re-compact to a minimum of 95% of maximum dry density.
≥ 5 Feet	Before usable material is placed, scarify existing ground, then re-compact to the satisfaction of the engineer.
Cut	
*** Cut Surface**	The top 12 inches of any cut section shall be processed by scarifying and compacting the exposed soil. When the soils encountered are unstable, the material shall be undercut and removed as directed by the engineer or contract and plans. The soil shall be compacted to the requirements of general embankment construction to achieve 100% payment density in base course above. When stable soils cannot be reached, embankment materials will be "bridged-in" and embankment materials meeting the requirements for general embankment construction will be constructed on top of the cut area to achieve 100% payment density in base course above.
Existing Roadbed Within Two Feet of Finished Subgrade	
	Scarify to at least 9" depth. Re-compact to at least 95% of maximum dry density.
***** For direct placement of subbase or base course only.	

EXISTING SURFACE PREPARATION FOR EMBANKMENTS, SUBBASES, AND BASES BASED ON STANDARD SPECFICATIONS

TRANSITIONS FROM CUT TO FILL

Transition zones between cut and fill sections are traditionally unstable areas that lead to premature failures. In order to ensure a smooth transition and to minimize the instability of the transitional area, the cut section should be extended for the full width of the embankment into the area to be filled to a point where the embankment fill height will reach full depth or at least three feet, whichever is less. The sloped area of the transition of the cut is the most critical. This slope should be at a ratio of approximately 1:1 or cut in steps in accordance with Standard Specification Section 203. The engineer will determine the construction to be used, based on field conditions, fill, and cut heights and depths, and material qualities. However, it is recommended that required additional excavation be limited to 50 feet on each side of a transition point. The intent of this construction technique is to eliminate the placement of only a thin edge of embankment material caused by the featheredging of the fill into the cut area. In areas of low relief, the project engineer will make whatever modifications are necessary to this technique to ensure a stable transition from cut to fill. Refer to the sketch in the Appendix on page A-11.

QUALITY CONTROL (QC) – BLENDING METHODS OF SOILS

Each lift of material is to be uniformly blended by a mixing process approved by the engineer. Blending shall ensure that the material is uniform for the full thickness and width of the lift. Blending may be accomplished by using an in-place mixer, disking, the use of a motor patrol, or equipment designed to pulverize and blend soils. The in-place mixer is the most effective for vertical blending of material.

The use of a sheepsfoot roller is <u>NOT</u> an approved method for blending soils.

Any of the techniques mentioned can be effective in blending material vertically; however, to properly blend material across the roadway, special techniques may be required. Equipment used to spread material across the roadway (e.g., motor patrol) is **not** effective in blending material throughout its depth; however, is very effective at moving material across or up and down roadway.

QUALITY ASSURANCE DOCUMENTATION

Project personnel will document construction progress, inspection, and acceptance testing in an electronic field book or in accordance with standard Department practice. Thickness, width, grade, and cross slope will be particularly noted. Sections and lifts are to be numbered for easy identification. Each test is to be identified by a descriptive numerical system that includes the project number, section number, lift number, and test number. When failing tests occur, a letter designation should be used for any additional tests taken in that section to correlate them to the initial failing test.

204 - Temporary Erosion Control

In accordance with Standard Specification Section 107, the contractor shall protect the project and adjoining properties from soil erosion and siltation by effective and continuous erosion control methods. The area of bare soil exposed by construction operations shall be kept to a minimum. The contractor shall install and maintain temporary erosion control to prevent sediment from escaping from the right-of-way. Erosion control features shall be in accordance with the Storm Water Pollution Control Plan in the plans as modified by the engineer to adapt to field conditions, as needed, and as otherwise directed by the engineer.

The intent of erosion control is to prevent sediment pollution of streams, lakes, tidal waters, reservoirs, canals, and other impoundments as a result of construction operations.

TEMPORARY SEEDING

Temporary seeding shall be performed in accordance with Standard Specification Section 717, except that complete bed preparation may not be needed. It is to be noted that only rye grass is approved for winter cover. However, since even ryegrass will not germinate at temperatures below 35°F (1.6°C), temporary grass must be planted early enough in the year to ensure germination and grass cover. Rye will not grow below 55°F (13°C). Rye should be planted from September to November. From November to April, it is too late to plant grass to protect slopes from wintertime erosion. The recommended application rate for rye grass for temporary cover is 30-40 pounds per acre. It is possible to interseed other grasses with rye to provide continuous cover in late spring and summer when rye dies. When other grasses are interseeded with rye, it will be necessary to mow the rye grass in mid-spring to ensure the germination of other seeds. The use of perennial rye grass is not recommended, because it will regerminate each year and become a maintenance problem. Fertilizer is needed to ensure grass growth. Water must be adequate to ensure germination and growth. If rye or other grass is used as a nurse crop for permanent cover, complete bed preparation in accordance with Standard Specification Section 717 will be required before the rye is planted. When temporary grass is to function as an erosion

control measure for an extended time-period, top dressing with an appropriate fertilizer will be required to maintain growth.

When temporary seeding is used as an erosion control measure late in the year, alternate measures should also be used to ensure that erosion control is in place, in the event the grass fails to develop adequate cover.

TEMPORARY MULCHING

Construction details for temporary mulching are published in Standard Specification Section 716. Materials specifications for mulch and tacking agents are published in Standard Specification Sections 1004 and 1018, as well as the Approved Materials List. It is critical that the mulch be kept dry prior to application. If the mulch becomes wet, it cannot be applied properly. It is to be kept covered and stored in accordance with Standard Specification Section 106. Mulch is used to slow the velocity of water flow, reduce the impact force of raindrops, and to provide moisture retention in seeded areas.

SANDBAGGING

Sandbags are to be stacked. Sandbags restrict the flow of water; therefore, they are to be used to direct the flow of water or to stop water flow. The length of time that sandbags will be effective as erosion control depends on the time it takes the bag itself to deteriorate or the area upstream of the bag to fill with soil. In accordance with Standard Specification Section 204 - place sandbags as shown on the plans or as directed.

BALED STRAW OR HAY

Baled straw or hay acts as a dam to water. When baled straw/hay is not properly installed, water will flow around or underneath the bales; therefore, it is necessary to bury straw/hay bales approximately four to six inches (100 - 150 mm). Water velocity can move straw/hay bales that

are not staked out of place. To ensure that they will remain in place, they must be firmly anchored with stakes in accordance with Standard Specification Section 204. When sediment build-up occurs in front of the straw/hay bales, additional bales are not to be placed on top of the existing bales. A new row of straw/hay bales is to be constructed in front of the existing one, burying the new bales in the sediment build up. It is important to observe the effectiveness of straw/hay bales and to add additional bales prior to any anticipated failure. Straw/hay bale barriers are to be used in minor swales or ditches; they are not to be used in live streams.

SLOPE DRAINS

Slope drains are used to channel water off the project to a proper discharge area. Slope drains direct the water down slope through a protected sluice, a ditch, or channel that has been lined to protect the bottom from erosion. The most commonly used lining material is plastic sheeting; however, other materials may be used, including paving the sluice with concrete. Baffles are sometimes used in the sluice to slow the velocity of the water; the discharge area at the end of the drain must be protected from erosion. Slope drains are usually used in conjunction with an earth berm to collect water from the project and direct it into the slope drain. Construct slope drains in accordance with plan details or as directed, to prevent scour in accordance with Standard Specification Section 204.

SEDIMENT BASINS

A sediment basin is an artificially created pool that decreases the velocity of running water, allowing sediment to settle to the bottom of the pool. Sediment basins are often used in conjunction with check dams or silt fences. They are often dug at naturally occurring low places to ensure the collection of sediment. Sediment basins must be large enough to accommodate anticipated runoff from the drainage area. It may be necessary to use multiple basins, especially if the sediment basin is used alone. **Regular maintenance is the key to the proper functioning of a sediment basin.** Sediment must be removed from the basin before it reaches a height at which heavy or prolonged rain will cause the basin to overflow, carrying silt outside

the basin. When maintaining a sediment basin, the contractor is to consider the accessibility of the surrounding terrain to equipment after rain. When heavy or prolonged rains occur, the surrounding area can often become too wet for cleaning equipment to maneuver. Construct sediment basins in accordance with plan details or as directed in accordance with Standard Specification Section 204.

SILT FENCING

Silt fencing materials shall conform to Standard Specification Section 204. Posts shall be installed a minimum of two feet into the ground. It is good practice to incline the posts slightly toward the direction of water flow to ensure that the force of water and sediment build-up forces the posts upright, not backward. It may be necessary to add additional posts and bracing to prevent the fence from being moved out of place. The bottom of the fencing should be buried about four inches (100 mm) to prevent sediment from washing under the fence. Silt fences often require a sediment basin in front to catch and slow water velocity before it reaches the fence. **It is critical to the effectiveness of a silt fence that it be maintained properly.** Holes in the fencing must be immediately repaired. The sediment basin must be cleaned at regular intervals and fence supports checked and braced to ensure that runoff does not undermine or wash out the fence. The contour of the land must be taken into account when aligning a silt fence. The fence should be strung across the path of drainage to entirely block runoff. Wings can be constructed at each end to direct water and to prevent sediment from flowing around the ends of the fence. Silt fencing is not to be used in live streams.

BERMS

Earth berms can be used independently as check dams or to direct water off the project. They are often used in conjunction with slope drains. To protect the berm from eroding, it should be compacted to adequate density and be built of soils that do not erode easily. Sediment deposits adjacent to the berm must be checked and cleared regularly to prevent the water from flowing over the top of the berm.

TEMPORARY CONSTRUCTION ENTRANCE

Temporary construction entrances are used to reduce dust or mud generated by construction traffic as it enters or leaves construction sites. They are constructed of specified aggregate over geotextile fabric. The contractor must routinely maintain them due to the construction stresses to which they are subjected. Mud tracked on adjacent roadways is not to be allowed. Per Standard Specification Section 204, a wash rack may be required to remove mud from tires before leaving the construction entrance.

QUALITY ASSURANCE DOCUMENTATION

Erosion control is a very sensitive environmental issue involving the contractor, the Department, the public, and a variety of other governmental agencies. Due to the nature of this construction activity, it is important to keep a complete and accurate record of all actions taken, all permits, all correspondence, and all agreements in a permanent file continuously available to authorized personnel.

The contractor and project engineer are to work in close unity in conforming to the quality intended in the performance of these construction activities.

The daily routine of checking erosion control devices shall be done promptly with any necessary corrections completed immediately. When severe weather threatens, an extensive inventory of erosion control will be taken to ensure that any damage is minimized. In accordance with Standard Specification Section 204, when severe weather causes extensive damage to erosion control devices, the contractor will take immediate steps to correct damage and return the project to its initial state.

301 - Class I Base Course

Class I Base Courses will be placed on a subgrade layer built in accordance with Standard Specification Section 305. This design feature is the primary difference between Class I and Class II Base Courses. Class I Base Courses that are stabilized with cement must always be produced in a central mix plant. Unless otherwise specified, the contractor may elect to use any of the types of Class I Base Course listed in Standard Specification Section 301; however, the same type must be used throughout the project, unless a plan change is submitted and approved by the DOTD Chief Engineer. The plan change will stipulate the type of Class I Base Course to be allowed in each location of the project.

In locations where normal construction practices for Class I Base Course are seriously impeded, the Department may allow the contractor to use Portland cement concrete conforming to Standard Specification Section 901 in lieu of the Class I Base Course type selected for the project. The district Area Engineering office will coordinate the decision to allow the use of Portland cement concrete and the determination of the areas in which it is to be allowed. Such concrete construction shall be performed in accordance with the Standard Specification Section 706.

MATERIALS

It may not be possible to use all materials that are approved for use in Class I Base Course in all central mix plants. The contractor shall determine which materials can be uniformly fed and mixed by the plant.

DOTD plant certification and approval of materials for use in no way guarantees their success on the project. Such approvals only mean that the contractor may use the equipment and materials. It remains the contractor's responsibility to ensure the materials when processed meet specification requirements.

Soils for Class I Base Course are to be naturally occurring and undisturbed. In-place soils, which have been disturbed and may have been treated or otherwise modified, are not approved for Class I Base Course.

Standard Specification Section 301 prohibits the blending of individual soils that do not meet specification requirements with other soils meeting specification requirements even if the resulting combination will meet specification requirements. (For example, for materials to be cement stabilized, a soil with a P.I. of 20 shall not be blended with an A-4 classified material, even if the resulting blend meets specifications. The blending is prohibited because soil with a P.I. of 20 does not meet specifications for Class I Base Course and uniform blending cannot be guaranteed.)

CLASS I BASE DESIGN

Soil or soil-aggregates to be incorporated into a Class I Base Course will require a design based on either gradation or strength. The cement factors for sand clay gravel are specified; therefore, compressive strength testing is not necessary. Sand clay gravel shall be composited to ensure that the resulting blend of individual components meets the specification requirements for the base course material. It shall be the responsibility of the contractor to determine the gradation of the composited material and to submit it to the district laboratory engineer for approval. The contractor shall contact the district laboratory engineer if there are any questions regarding the proper materials or the appropriate percent cement.

When cement is to be added to soil or soil-aggregates and the percent cement is not included in the contract specifications, materials will be subjected to procedures to determine minimum design strength. When a method other than DOTD TR 432 - Method A is used to determine the percent cement needed to stabilize a soil, the Department may require the maximum time allowed by specifications to perform the test. Method A will require at least five days. When soils are to be stabilized with cement, the district laboratory engineer will determine which method of test is appropriate. The Department will perform all cement design. It shall be the responsibility of the contractor to build the dedicated stockpile and request approval far enough in advance of planned construction operations to allow for this testing and design. The contractor shall provide stockpiles of actual materials that are to be tested for stabilization.

The cement factor to be used for soil stabilization will be determined by the Department and will be based on strength. It is the responsibility of the contractor to advise the district laboratory engineer and the project engineer of the type of cement to be used for stabilization (Type I, IB, II, or IP). The district laboratory will use the same type of cement to determine the cement factor. If the contractor does not inform the district laboratory of the type of cement to be used, the cement factor will be determined using Type IB. The contractor will then be required to use Type I or IB for stabilization. If the contractor does not use Type I or IB, operations will be delayed until the district laboratory can determine a new cement factor.

When any type other than IB cement or I is used for soil stabilization, the Department will not use DOTD TR 432 - Method A to determine the cement factor.

DOTD TR 432 - METHOD A will be used to determine the percent cement only when soils to be stabilized are naturally occurring, previously undisturbed in a borrow pit, and are materials with no history of stabilization problems.

The contractor shall fill out the appropriate information under the Header, Materials, and Gradation (if applicable) portions found on the *Base Course Design for Central Plant Materials Mixtures* form, a reprint is found on page A-37 in the Appendix. The Department will design, provide, and enter the additive rate. This information is derived from the test results documented during the approval process for dedicated stockpiles, included composited materials, and other documents provided by the Department. When two or more soils are being composited and mixed, each stockpile will require individual approval. Once the stockpiles are approved, the mix design may be submitted with the proposed percentages of each for composite. Soil cement design, the percent cement, optimum moisture, and maximum dry density will be determined on the proposed composite.

The district laboratory will complete the bottom portion of the *Base Course Design* form, recording the maximum dry density and optimum moisture content. A copy of the *Base Course Design* will be provided to the contractor and the project engineer. The *Base Course Design* is to be incorporated into the 2059 Review. If the design proposal is not approved, the district laboratory engineer is to sign the form, and emphasize "not approved," making sure to enter the reason for disapproval in the remarks, and then return the form to the contractor. **No mixture is to be**

delivered to the project until a mix design has been approved; therefore, there will be no electronic Materials database entry of a disapproved mix design proposal.

PLANT LOT

A basic plant lot for a central mix plant operation consists of a day's production of an individual plant from one mix design. When an acceptance test indicates that a payment adjustment for percent cement is required, the lot shall be terminated. A new lot number will be assigned for the material produced following adjustments by the contractor that result in a QC test showing successful correction. If a plant discontinues the day's operations before an acceptance test has been performed, acceptability and percent pay will be determined based on investigation of QC tests, the plant's condition and performance, and other Department tests necessary to evaluate the material (e.g., cement content, compressive strength). The Department may unilaterally terminate a lot when inspection procedures, QC or acceptance tests indicate loss of control of the product or operation that may cause non-specification material to be delivered to the project.

PROTECTION AND CURING

When traffic, including construction traffic, is allowed on the base course, and the surfacing is to be asphalt concrete, at least the first lift of surfacing shall be placed within thirty days of the completion of the base course section.

Immediately after finishing the base course, the contractor shall spray an asphalt curing membrane or prime coat over the finished section in accordance with Standard Specification Section 505 or 506 respectively. This membrane shall completely cover the finished base course. Complete coverage shall be maintained until the placement of the next course. Unless required by the Department, no traffic, including construction traffic, shall be allowed on the base course for at least 72 hours after the application of the curing membrane. This period is designed to allow stabilized base course to develop adequate strength to support axle loads without structural damage and it allows the prime coat on raw base courses to cure without damage.

The contractor shall be responsible for the completed base course. It shall be protected from damage from public or construction traffic or construction operations. The contractor shall make any necessary repairs, including patching or reconstruction, and reapplication of the protective coating. All correction of deficiencies shall be completed at least 24 hours prior to the placement of the subsequent lift over the base course.

QUALITY ASSURANCE DOCUMENTATION

Tests and inspections required by the specifications, this manual, or other Department publications must be documented. QA documentation for asphalt concrete or Portland cement concrete when used as a Class 1 Base Course must meet the requirements of the appropriate application in Standard Specification Sections 501, 502 or 901. The Department provides standard forms for documentation that are to be used by both contractor and Department personnel, as specified. These forms are required in addition to electronic field book entries and the Project Diary required of DOTD construction personnel. Forms are to be properly completed and, when indicated, submitted with the Form 2059 - Summary of Test Results. QA documentation verifies that the project has been built in accordance with the contract, plans and specifications. Copies of QC documentation shall be provided to the project engineer as directed.

DAILY CENTRAL MIX PLANT REPORT

The *Daily Central Mix Plant Report* is provided for the contractor to document routine testing at the central mix plant. It serves as both a worksheet and final documentation of plant operations. The contractor's *Daily Central Mix Plant Report* is to be kept on file at the plant and made available for review by DOTD personnel upon request. Department personnel will use the plant report as a worksheet during testing. All *Daily Central Mix Plant Report* forms for the project shall be provided to the project engineer for inclusion with Form 2059. A reprint of The Daily Central Mix Plant Report is on page A-41 in the Appendix.

PROPORTIONING OF COMPONENTS

The cold bin feed percentages shall be checked against the percentages approved on the *Base Course Design* form. The actual bin percentages shall be reported on the *Daily Central Mix Plant Report*. Proportions of all components shall be checked each time cement content is checked. Proportions are to be checked in accordance with DOTD TR 436.

ADDITIVE CONTENT

The actual percentage of cement being incorporated into the mixture shall be checked and compared to the approved percentage from the *Base Course Design*. Following the test, the actual percentage shall be recorded on the *Daily Central Mix Plant Report* for the initial truck. The contractor shall check the percent cement at the beginning of each day's operation and at least four more times each day. Additionally, whenever the plant discontinues operations during a day, the percent cement shall be rechecked when operations are resumed. These checks shall be performed by the contractor for QC and by the Department for acceptance at the minimum frequency stipulated in the *Materials Sampling Manual*.

QC results are to be entered only when a test is performed. When new QC tests are performed, they are to be documented on the form, indicating the test number, time, and load number of the material from which the test sample was taken. Test results are to be entered on the form on the next truckload after results are obtained. When there is no test data to be entered, the certified technician is to check the appropriate block regarding design criteria and sign the form. The signature indicates that there have been no changes in production since the last QC test.

MOISTURE CONTENT

Prior to beginning daily operations, the contractor's certified inspector shall determine the moisture content of stockpile material. This moisture content shall be used to adjust the amount of water to be added to the mixture. Once operations have begun, the moisture content of the material from the pugmill discharge shall be checked to ensure that the moisture in the mix at the time of compaction will be within the specification range of ± 2%. Moisture content of the blend shall be checked at the beginning of each day's operation, when operations are resumed after a discontinuance, and at least two more times each day. This moisture content data is to be recorded on the *Daily Central Mix Plant Report*.

ACCEPTANCE TESTS

Tests for percent cement, moisture content, and pulverization will be documented on the *Daily Central Mix Plant Report* by the DOTD inspector. The contractor's Certified Technician is to review the form and sign it to indicate that this review has taken place. All materials should be checked for individual conformance and proper proportioning at the rates detailed in the Materials Sampling Manual.

All materials should be checked for individual conformance and proper proportioning at the rates detailed in the Materials Sampling Manual.

CERTIFICATE OF MATERIAL PROPORTIONS (HAUL TICKET)

The contractor’s certified technician documents testing at the plant using the *Certificate of Material Proportions for Base Course form*. The form is to be completed by the contractor's certified technician for each truck and updated each time a QC test is performed. The contractor's certified technician shall summarize the results of the most recent tests from the *Daily Central Mix Plant*

Report as required on the *Certificate of Material Proportions for Base Course*. The "Lot No." shown on the form refers to the "plant lot." The load numbers will be consecutive per plant lot. The Department will control the assignment of lot numbers. The lot number will correlate to the lot number shown on the *Daily Central Mix Plant Report*. The original *Certificate of Material Proportions for Base Course* completed by the contractor's certified technician is to be given to the driver of each hauling unit. The driver is to give the completed form to the DOTD inspector at the job site. The contractor's technician is to keep at least one copy of each *Certificate of Material Proportions for Base Course* at the plant for review by Department personnel.

The inspector at the project site will use the *Certificate of Material Proportions for Base Course* to document the location of material on the project. The location of material to which a payment adjustment will apply must be identified to determine the final percent pay for each section. The beginning and ending stations of each lot must be documented. The location of any material placed on the project that does not meet specification requirements is to be documented for later correction. A reprint of *The Certificate of Material Proportions for Base Course* is on page A-13 in the Appendix.

QUALITY ASSURANCE DOCUMENTATION

The test procedure DOTD TR 401 - The Determination of In-Place Density, contains a worksheet to be used to facilitate the calculations associated with the determination of density, moisture, and pulverization. A reprint of the Density & Moisture Content Worksheet is on page A-15 in the Appendix. **This worksheet is to be completed in conjunction with DOTD TR 401 and used for these calculations.** Department personnel will submit this form for acceptance testing regularly to the district laboratory for electronic Materials database system entry. The district laboratory will retain the original for inclusion in the 2059 Review. A copy of the documentation of QC tests and results shall be given to Department personnel. The percent pay for density will be completed for treated or stabilized base only.

302 - Class II Base Course

Class II Base Courses are similar to Class I Base Courses; with the exception, that placement on a subgrade layer built in accordance with Specification Section 305 is not required. Likewise, central plant mixing is not always required for cement treated Class II Base Courses. When construction is in a dust sensitive area and cement treated Class II Base Course is to be constructed, central plant requirements will be specified in the project plans. **When central plant mixing is necessary or is elected by the contractor, the requirements of Class I Base Course, Standard Specification Section 301, will apply.**

In locations where normal construction practices for soil cement, cement treated or aggregate base are seriously impeded, the project engineer may allow the contractor to use asphalt concrete conforming to Standard Specification Section 502 or Portland cement concrete conforming to Standard Specification Section 901 in lieu of the Class II Base Course type selected for the project. Such concrete construction shall be performed in accordance with Standard Specification Section 706 and shall be of the same thickness and width as the base course shown on the plans.

The requirements of soil for soil cement are modified from Standard Specification Section 301 by increasing the P.I. to a maximum of 15. Additionally, asphalt concrete, when used, is placed on an embankment layer rather than a treated layer. The embankment layer must meet the same requirements as the top layer of embankment in accordance with Standard Specification Section 203.

QUALITY ASSURANCE DOCUMENTATION

When a central mix plant or in-place mixer is used to produce stabilized or treated base course, the documentation requirements for Class I Base Course will apply. The in-place documentation will be as related to roadway quality assurance documentation only.

When the base course being constructed is raw aggregate, the documentation requirements of Standard Specification Section 301 will apply.

SPECIAL TRAFFIC CONSIDERATIONS

The contractor shall provide a qualified flagger who will stop vehicles before they enter the cement area. The qualified flagger is to impress on the drivers the need to travel extremely slowly through the loose cement. Loose cement is highly flowable and dust prone; therefore, if traffic is allowed to disregard the situation, the cement will be displaced and the percent incorporated into the soil will not be uniform or proper. Likewise, the disturbed cement dust may become airborne, making it possible for the dust to be drawn into the air-intake of an automobile, which may in turn cause engine failure. This dusting characteristic may also result in airborne particles that adversely impact the environment, and may infringe on environmental protection regulations.

When traffic is allowed over the area, the contractor shall control the operation to manage free traffic flow through the project. Equipment shall not obstruct the orderly flow of traffic

303 - In-Place Cement Stabilized and Treated Base Courses

In-place cement stabilized and treated base course is intended for the reconstruction of existing roadways in which the Department furnishes material (meaning the material already exists in-place on the roadway). If insufficient material exists on the roadway to meet grade and cross slope or the existing material will not stabilize, the contractor will be required to provide additional material and construct the base in a manner similar to that required for Class II Base Course. When the contractor must supply additional material to be blended with existing in-place materials, the resulting blend must be submitted for cement design by the district laboratory. It is important to note that materials supplied by the contractor must meet the requirements of Standard Section 302; however, these materials will be paid for under Standard Section 203.

When the existing surface is asphalt concrete, to construct an in-place cement stabilized base course, the contractor shall cold plane the existing surface in accordance with Standard Section 509. The remaining material will then be blended and pulverized vertically, and for the full width of the area to be stabilized, to form a uniform material composite.

In locations where normal construction practices for in-place cement stabilized base course are seriously impeded, the project engineer may allow the contractor to use asphalt concrete meeting the requirements of Standard Specification Section 502, or Portland cement concrete conforming to Standard Specification Section 901 in lieu of the in-place cement stabilized base course type selected for the project. Such concrete construction shall be performed in accordance with the Standard Specification Section 706.

DESIGN

The cement content to be used will be determined by the district laboratory and will be based on strength. In-place materials to be stabilized under this section do not naturally occur as soil, and are usually modified chemically, have a long history of manipulation and weathering, and have no predictable strength gain when mixed with cement. The strength of in-place materials must be determined by actual laboratory design procedures. It is the responsibility of the contractor to advise the district laboratory engineer and the project engineer of the type of cement to be used for stabilization (Type I, IB, II, or IP). The district laboratory will use the same type of cement to determine the cement factor. If the contractor does not inform the district laboratory of the type of cement to be used, the cement factor will be determined using Type IB. The contractor will then be required to use Type I or IB for stabilization. If the contractor does not use Type I or IB, operations will be delayed until the district laboratory can determine a new cement factor.

EDSM I. 1. 1. 11 directs the district laboratory engineer, as part of the district design procedure, to make recommendations for the redesign of existing roadways to be upgraded under the district overlay program. Prior to plan development, the district laboratory engineer is to determine the type, depth and width of the pavement, overlay (if applicable), base, and subbase (if applicable), and the thickness and type of material in the top layer of embankment for both roadway and shoulders. It is the responsibility of the district laboratory engineer to determine if in-place stabilization of existing material is an effective construction option. When reaching this determination, the district laboratory engineer is to consider that all but one inch of surfacing will be removed.

If the district laboratory engineer recommends in-place stabilization (Standard Specification Section 303), the laboratory is to determine how much material is available for stabilization, if the material will stabilize, if lime treatment of any material to be stabilized is necessary, and if it will be necessary for the contractor to furnish additional material. Approximately twelve inches of suitable material are needed for stabilization to accommodate grade, cross slope, depth of cut, and other factors of construction operations. These design recommendations are made far in advance of the contract letting date. The district laboratory engineer is to establish that in-place stabilization under Standard Specification Section 303 will be viable and an option in the final typical section. This determination requires coordination with the District Design and with respect to the final design. When the district laboratory engineer makes recommendation for in-place

stabilization on **Attachment #7 of EDSM I.1.1.11**, (a reprint of attachment 7 is on page A-59 in the Appendix) laboratory personnel are to identify the design percent cement in accordance with DOTD TR 432 for the various soils identified under the existing pavement. When lime treatment of the base is recommended, tests are to be performed on soils with the addition of lime at the recommended percentage.

When specified and the contractor provides additional material to adjust grade, the process for determining cement factors will need modification. If the laboratory engineer determines that a full design is required, samples will have to be taken from the roadway after the new material has been added, pulverized, and blended. Otherwise, the cement factor will not be representative of the blend being stabilized. Predetermined cement factors do not apply to this situation. This process may require the maximum time allowed by DOTD TR 432 to determine the percent cement.

QUALITY ASSURANCE DOCUMENTATION

When in-place mixing is used to produce a stabilized base course, the documentation requirements for Class II Base Course Standard Specification Section 302 will apply.

SPECIAL TRAFFIC CONSIDERATIONS

The contractor shall provide a qualified flagger who will stop vehicles before they enter the cement area. The qualified flagger is to impress on the drivers the need to travel extremely slowly through the loose cement. Loose cement is highly flowable and dust prone; therefore, if traffic is allowed to disregard the situation, the cement will be displaced and the percent incorporated into the soil will not be uniform or proper. Likewise, the disturbed cement dust may become airborne, making it possible for the dust to be drawn into the air-intake of an automobile, which may in turn cause engine failure. This dusting characteristic may also result in airborne particles that adversely impact the environment, and may infringe on environmental protection regulations.

When traffic is allowed over the area, the contractor shall control the operation to manage free traffic flow through the project. Equipment shall not obstruct the orderly flow of traffic.

304 - Lime Treatment

Lime treatment is defined as the addition of lime to soil or soil-aggregate to modify the material's characteristics. Water must also be added to adjust the moisture content of the mixture to facilitate the chemical reaction of the lime and aid compaction.

Standard Specification Section 304 designates the following types of lime uses:

TYPE	USE
Type-B	Base or Subbase
Type-C	Conditioning for Cement Treatment or Stabilization
Type-D	Working Table under or within an Embankment
Type-E	Conditioning and Drying for Subgrades under a Base Course

TYPES AND USES OF LIME TREATMENT

MIXING EQUIPMENT

The in-place mixer defined in Standard Specification Section 303 is required for all types of lime uses. The engineer may approve other types of equipment for Types-D and E when certain conditions occur (e.g., boggy areas) where in-place mixers are not practical. When high PI soils are to be modified, the in-place mixer may not be adequate for complete mixing due to the heaviness of the soil.

Initial mixing may be achieved with a disc and final mixing with an in-place mixer.

SPECIAL TRAFFIC CONSIDERATIONS

The contractor shall provide a qualified flagger who will stop vehicles before they enter the cement area. The qualified flagger is to impress on the drivers the need to travel extremely slowly through the loose cement. Loose cement is highly flowable and dust prone; therefore, if traffic is allowed to disregard the situation, the cement will be displaced and the percent incorporated into the soil will not be uniform or proper. Likewise, the disturbed cement dust may become airborne, making it possible for the dust to be drawn into the air-intake of an automobile, which may in turn cause engine failure. This dusting characteristic may also result in airborne particles that adversely impact the environment, and may infringe on environmental protection regulations.

When traffic is allowed over the area, the contractor shall control the operation to manage free traffic flow through the project. Equipment shall not obstruct the orderly flow of traffic.

TYPE-B TREATMENT

Type-B lime treatment is used to treat material intended to serve as a Base course or Subbase layer.

Mixing Equipment (Type-B)

For Type-B treatment, an approved in-place mixer that meets the same requirements of In-Place Cement Stabilized Base Course (Standard Specification Section 303) must be used.

Construction Details (Type-B)

The lime is to be mixed into the soil or soil-aggregate with an approved in-place mixer. The lime is to be spread fully in a single application. Extra water is required to activate the lime. When

lime slurry is used, the amount of water in the slurry will have to be considered when determining the amount of water to be added. Generally, the water in the slurry is not sufficient to chemically treat the soil material and additional water will have to be added before the construction sequence is complete. When the material is at the proper moisture content for the chemical reaction to occur, it will appear excessively wet. **Sufficient water is to be added through the in-place mixer to provide for the chemical reaction between the lime, water, and soil**. The amount of water required to activate the chemical reaction will bring the soil/lime mixture significantly above optimum moisture content determined by DOTD TR 415 or TR 418. The area is then sealed with rollers and allowed to mellow for 48 hours. Lime that is not sealed will oxidize through exposure to air and will not perform as required. The timing for the 48-hour mellowing period will begin when sealing is completed.

Following the 48-hour mellowing period, the lime treated area is pulverized with the in-place mixer until specification pulverization requirements are met. The addition of a small amount of water may be necessary to bring the soil/lime mixture to within the specifications for optimum moisture content. Acceptance samples for moisture content and maximum dry density are to be taken immediately prior to compaction for acceptance. DOTD TR 415 or TR 418 may be used for this determination. The area is then compacted to at least 95.0% of maximum dry density and finished. Compaction and finishing must be completed within 6 hours of achieving pulverization. If the area cannot be compacted to specification density and finished within the six-hour time limit, the contractor will be required to make adjustments in the operation to prevent this from recurring in subsequent sections. **Sections not completed within the time limit will not be accepted.** Reconstruction with an addition of the original percent lime will be required at no direct pay. Sections that do not meet the minimum density requirements after the six-hour time limit will not be accepted and must be reconstructed as directed by the engineer.

Protection and Curing (Type-B)

The lime-modified soil shall never be allowed to dry out. The contractor shall apply an asphalt curing membrane complying with Standard Specification Section 506 over the surface of the completed area as soon as smooth rolling is completed. No traffic, public or construction, shall be allowed over the completed lime treatment for the 72-hour curing period. When traffic must

be maintained, it is to be routed off the completed course onto shoulders or other suitable areas, when conditions permit. Any damage to the lime treatment is to be corrected by the contractor.

Quality Control (Type-B)

When lime is delivered in bulk, it shall be the responsibility of the contractor to determine the spread rate and length of spread for each transport.

After the 48-hour mellowing period, the contractor is to observe the blended material for uniformity of mixing. QC personnel shall determine the moisture content of the lime treated material after the 48-hour mellowing period, but before compaction begins, to ensure that the material will be within an acceptable range of optimum moisture during compaction. The contractor is to determine the percent pulverization following the in-place mixer in accordance with DOTD TR 431. If the specification requirements are not met, the contractor is expected to alter the operation or equipment to ensure that all specification requirements are met. The contractor is to monitor pulverization and finishing ensuring that they are completed within the six-hour time limit.

Additionally, the contractor is to monitor the operation to ensure uniformity. No segregation, contamination, soft spots, wet spots, laminations, undulations or other variations in elevation are to be left uncorrected. The contractor is to check thickness, width, cross slope, and grade (when applicable), to ensure that the finished project matches plan requirements.

Inspection and Acceptance (Type-B)

If the percent of lime is not designated, the district laboratory will determine it in accordance with DOTD TR 416.

Project personnel will independently determine spread rate and length of spread. If the spread rate is not correct or is not uniform, the inspector is to require the contractor to make immediate

corrections to ensure that the minimum percent lime is uniformly applied. Continuous placement of lime will not be allowed until it has been established by the Department that the minimum percent of lime is being uniformly applied.

Project personnel will determine the moisture content of the lime treated material after the 48-hour mellowing period, but before compaction begins, to ensure that the material will be within an acceptable range of optimum moisture during compaction. This test will be performed in accordance with DOTD TR 403. When maximum dry density is to be determined in accordance with DOTD TR 415 or TR 418, the material to mold the proctor will be obtained from beneath the nuclear device or from the area immediately adjacent to the sand-cone density hole.

Project personnel are to determine the percent pulverization, prior to compaction in accordance with DOTD TR 431. The inspector is also to monitor the six-hour time limit between pulverization and completion of compaction and finishing. Compaction is to be started as soon as pulverization is achieved.

Project personnel are to determine the percent compaction in accordance with DOTD TR 401 after compaction and finishing are completed. If the minimum percent density defined by the specifications has not been met, the contractor is to be required to reconstruct the area, beginning with reapplication of lime.

DOTD TR 602 Measurements (Type-B)

The district laboratory will determine thickness and width for final acceptance in accordance with DOTD TR 602.

Department personnel will maintain documentation of construction progress, inspection, acceptance tests, etc., in an electronic field book and on proper electronic Materials database forms if applicable, in accordance with standard Department practice. The length of spread, spread rate, pulverization (for Type-B), time of application, mellowing times, and thickness and width shall be noted.

TYPE-C TREATMENT

Type-C lime treatment is used for preparation of material prior to Cement Treatment or Stabilization.

MIXING EQUIPMENT (Type-C)

For Type-C treatment, an approved in-place mixer that meets the requirements of In-Place Cement Stabilized Base Course (Standard Specification Section 303) must be used.

Construction Details (Type-C)

Construction operations for Type-C Treatment are the same as for Type-B treatment, with the following exceptions shown below.

- There are no Atterberg Limits specified for Type-C Treatment.
- Shape and uniformly compact Type C lime conditioned materials to the required sections. Uniformly compact the mixture to at least 93.0 percent of maximum dry density. Determine the maximum dry density in accordance with DOTD TR 415 or TR 418 and in-place density in accordance with DOTD TR 401. When conditions, such as a yielding subgrade, make this impractical or detrimental, establish an optimum-rolling pattern to the satisfaction of the engineer *(per 304.07.2)*.
- No formal depth and width measurements in accordance with DOTD TR 602 will be required. Since there are no tolerances in the specifications, it will be the responsibility of the project engineer to determine that plan dimensions are satisfactorily met by using the guidelines of DOTD TR 602. Underwidths or underdepths will not be accepted and shall be corrected before beginning the next operation.
- No 72-hour cure is required for Type-C Treatment.

QUALITY CONTROL (Type-C)

QC requirements for Type-C Treatment shall be the same as for Type-B Treatment

TYPE-D TREATMENT

Type-D treatment is intended for constructing a working table upon which to place an embankment. It is to provide stability to support equipment to begin construction of the first lifts of embankment. **Type-D Treatment is not to be used in construction of embankment lifts or Base Course or Subbase conditioning**.

Mixing Equipment (Type-D)

For Type-D Treatment, an approved in-place mixer that meets the requirements of In-Place Cement Stabilized Base Course (Standard Specification Section 303) is required unless the engineer approves the use of other equipment. The equipment shall be capable of pulverizing the soil or soil-aggregate into particles small enough to be effectively coated with lime. If the soil is not adequately pulverized, the lime treatment will be ineffective. Heavy clays (e.g., above 30 P.I.) will require special effort to achieve adequate pulverization. Double tandem disks may be acceptable for mixing lime with the soil. A plough disk will not adequately pulverize the material for effective coating. Final blending with an in-place mixer is a superior method to ensure proper mixing and efficient use of the lime additive to achieve the highest quality product with the least amount of compaction difficulty.

CONSTRUCTION DETAILS (Type-D)

Lime is to be spread fully in a single application. Lime is to uniformly cover the entire area at the spread rate approved by the engineer. The spread rate shall meet the percent lime to be incorporated will be as required by the plans as directed by the district laboratory. There are no pulverization requirements established by the specifications; however, the material must be uniformly blended and the soil or soil-aggregate uniformly coated with lime to the satisfaction of the engineer.

Uniformly compact and finish Type D lime treated materials to the satisfaction of the engineer. Make reasonable efforts to conform to the compaction requirements of Specifications Section 304.07.1. When conditions, such as a yielding subgrade, make this impractical or detrimental, establish an optimum rolling pattern to the satisfaction of the engineer.

Protection and Curing (Type-D)

There is no curing method or time limit established by the specifications; however, it is important to the quality and effectiveness of the lime treatment process to keep the treated material moist, never allowing it to dry out. The contractor shall protect the completed lime treatment as directed. The contractor shall prevent damage to the lime treatment from traffic in the same manner as for Type-B. Any damage is to be corrected as directed.

QUALITY CONTROL (Type-D)

QC requirements for Type-D Treatment shall be the same as for Types B and C Treatments, with the exception that DOTD TR 431, pulverization test or control of a mellowing period will not be required.

Inspection and Acceptance (Type-D)

Inspection and acceptance procedures will be the same for Type-D Treatment as for Type-C Treatment, except that curing and pulverization will be to the satisfaction of the engineer.

TYPE-E TREATMENT

Type-E treatment is designed for use in embankment construction. Type-E lime treatment is embankment construction with lime treatment of the individual lifts of soil or soil-aggregate.

Mixing Equipment (Type-E)

The requirements for mixing equipment for Type-E Treatment shall be the same as for Type-D Treatment.

Construction Details (Type-E)

Lime is to be spread fully in one application for each lift of embankment. **After the lime is spread and mixed, the embankment lift is to meet the requirements for embankment construction in accordance with Standard Specification Section 203 and the guidelines of this manual for embankment.** Compact and finish Type E lime treated materials in accordance with Section 203.

When traffic conditions warrant and an adequate rolling pattern has been established that demonstrates density has been achieved, the engineer may reduce density frequency testing requirements to expedite construction. A change in subgrade materials will require testing at the original frequency until a new rolling pattern is established.

Protection and Curing (Type-E)

The contractor is responsible for the stability of embankments until final acceptance. Therefore, the contractor is to make every effort not to damage a lime treated lift of embankment in the same manner as required for raw embankment. Heavy loads, excessive exposure to hauling, too much water, or too little water are examples of conditions that may damage a lift (and underlying lifts) requiring reconstruction. There is no curing period or time limit established by the specifications, however, it is important to the quality and effectiveness of the lime treatment process to keep the treated material moist, never allowing it to dry out.

QUALITY CONTROL (Type-E)

QC requirements for Type-E Treatment shall be the same as for Type-B Treatment, with the exception, that there is no mellowing period and DOTD TR 431, pulverization test will not be required. There is no pulverization requirement specified; however, a poorly pulverized and blended material will be difficult to compact to specification density. The individual lifts of lime treated embankment will be constructed and the quality controlled by the contractor in accordance with Standard Specification Section 203.

Inspection and Acceptance (Type-E)

The inspection and acceptance procedures, including visual inspection, for Type-E Treatment shall be in accordance with Type-B treatment and Embankment Construction, and Standard Specification Section 203.

305 - Subgrade Layer

Subgrade Layer is primarily used for new roadway construction.
A subgrade layer is composed of soil materials treated with Portland cement, Portland-pozzolan blended hydraulic cement or a combination of Portland cement and lime, or construct a subgrade layer of stone, recycled Portland cement concrete, blended calcium sulfate, or asphalt concrete in accordance with plan details or as directed. A subgrade layer is constructed beneath a Class I Base Course or other designated layers to improve the quality and increase the support value of the top layer of material in the embankment.

After the contractor has selected the type of materials for the subgrade layer, the same type shall be used throughout the project.

SUBGRADE LAYER CONSTRUCTED WITH TREATED SOILS

Regardless of the mixing process, treatment with lime shall be in accordance with Standard Specification Section 304 for Type-C treatment. The minimum quantities of Portland cement and lime shall be in accordance with the following based on soil conditions:

P.I.	Lime or Cement (Percent by volume)
0-15	6 % cement
16-25	6 % lime and 6 % cement
26-35	9 % lime and 6 % cement

The engineer has the option of increasing or decreasing the percentages of cement and lime based on field conditions. The contract unit price for Subgrade Layer will be adjusted for the actual percentages of cement and lime required.

QUALITY ASSURANCE DOCUMENTATION

The contractor shall maintain documentation of the QC program as required by the engineer.

The inspection and acceptance procedures, including visual inspection, shall be in accordance with Class II Base Course, Standard Specification Section 302.

For blended calcium sulfate subgrade layer, the documentation requirements for non-plastic embankment, Standard Specification Section 203 and Class II Base Course, and Standard Specification Section 302 will apply.

306 - Scarifying and Compacting Roadbed

This section is designed for use when an existing road is being incorporated into new construction under traffic. The existing road must be prepared for reconstruction as a raw subbase or base course.

INSPECTION AND ACCEPTANCE

Project personnel will obtain a sample of the blended, pulverized material after it has been mixed uniformly across the roadway for determination of maximum dry density and optimum moisture in accordance with DOTD TR 415 or 418.

Following compaction by the contractor, project personnel will determine the percent compaction in accordance with DOTD TR 401 using the maximum dry density. If density is not met, reconstruction will be required.

TYPE	% OF MAXIMUM DENSITY, Min.
Base	98.0 %
Subbase	95.0 %

SPECIFICATION DENSITY REQUIREMENTS FOR BASE AND SUBBASE

QUALITY ASSURANCE DOCUMENTATION

The inspection and acceptance procedures, including visual inspection, shall be in accordance with Embankment and Excavation, Standard Specification Section 203.

307 – Permeable Bases

This work consists of constructing a permeable asphalt base or permeable concrete base on a prepared subbase.

When a permeable base is included in the contract, the contractor shall have the option to furnish either a permeable asphalt base or a permeable concrete base unless otherwise specified. The same type of base shall be used throughout the project unless otherwise specified on the plans or approved in writing.

Construction and application of quality assurance will be in the applicable Quality Assurance Manual for either Asphalt or Portland cement concrete.

Aggregates for use in Permeable Bases are of a very specific type and are larger in nominal size in order to create an open gradation that will permit water flow through the layer. Required aggregate gradation and properties will be listed in Standard Specification Section 1003.

JOB MIX OR MIX DESIGN APPROVAL

Contractor shall submit to the District Laboratory Engineer the proposed job mix formula or mix design with supporting data for approval in accordance with Standard Specification Section 502. Approval is required prior to starting work.

QUALITY ASSURANCE DOCUMENTATION

The inspection and acceptance procedures, including visual inspection, shall be in accordance with the applicable Quality Assurance Manual for either Asphalt or Portland cement concrete in Standard Specification Sections 502 or 901 respectively.

309 - In-Place Cement Treated Subgrade

This work consists of scarifying, pulverizing, blending, shaping and treating subgrade material with Portland cement, Portland-pozzolan cement, or Portland blast-furnace slag cement. An In-Place Cement Treated Subgrade layer is constructed beneath a Base Course or other designated layers to add an anticipated structural value to the subgrade materials for both design and to facilitate constructability. A Standard Specification Section 309 In-Place Cement Treated Subgrade layer should be considered of a slightly higher order pavement section than a Standard Specification Section 305 Subgrade Layer.

DESIGN

The design for In-Place Cement Treated Subgrade layer will generally be conducted during the design phase by the district laboratory engineer.

When the percent cement to be added is not included in the plans, the design will be conducted on in-place materials in accordance with TR 432 Method B or C from isolated random areas selected by the engineer.

The engineer has the option of increasing or decreasing the percentages of cement based on field conditions. Optimum moisture of the mixture will be determined in accordance with DOTD TR 415 or TR 418 the cement content will be increased by one percent by volume for every 3 percent of moisture content above optimum.

QUALITY ASSURANCE DOCUMENTATION

The project engineer will test to determine if the compaction and moisture requirements are met. The project engineer will take as many tests as necessary to ensure that each section of the subgrade layer meets the density requirements.

When in-place mixing is used to produce an in-place cement stabilized subgrade layer, the documentation requirements for Class II Base Course Standard Specification Section 302 will apply except that thickness and width measurements are to be recorded in the electronic field book by the project engineer personnel in accordance with TR 602.

SPECIAL TRAFFIC CONSIDERATIONS

The contractor shall provide a qualified flagger who will stop vehicles before they enter the cement area. The qualified flagger is to impress on the drivers the need to travel extremely slowly through the loose cement. Loose cement is highly flowable and dust prone; therefore, if traffic is allowed to disregard the situation, the cement will be displaced and the percent incorporated into the soil will not be uniform or proper. Likewise, the disturbed cement dust may become airborne, making it possible for the dust to be drawn into the air-intake of an automobile, which may in turn cause engine failure. This dusting characteristic may also result in airborne particles that adversely impact the environment, and may infringe on environmental protection regulations.

When traffic is allowed over the area, the contractor shall control the operation to manage free traffic flow through the project. Equipment shall not obstruct the orderly flow of traffic.

701 - Culverts and Storm Drains

Earthwork forms a part of the conduit installation procedures. In order to ensure an adequate foundation for such conduits, backfill material must meet certain specifications and be compacted to adequate density by acceptable methods. The use of poor soils as a bed for conduit, the failure to adequately compact soils surrounding conduit, or poor construction techniques can lead to premature failure of drainage systems, embankments, and surfacing.

The scope of this section is limited to the earthwork associated with the installation of culverts and storm drains.

TRENCH EXCAVATION AND BEDDING

For all types of drainage structures, the trench must be at least 18 inches wider than the conduit on each side or as indicated on the plans. For example, the bottom of the trench must be at least 36 inches wider than the diameter of the pipe, plus wall thickness. The bottom of the trench must be graded so that the flow line of the conduit will match the flow line shown on the plans. In the case of multiple lines of conduit, the trench shall be at least 36 inches plus the outside dimensions edge to edge of the multiple lines of conduit including the plan distance between the lines of conduit. When the trench is in suitable, stable foundation material, the trench shall conform to plan grade and dimensions.

When the excavation must be below specified grade because of unsuitable, but stable foundation material (e.g., rock, dense, heavy clay); a cushion must be formed for the conduit. The cushion must be constructed with backfill material appropriate to the type of pipe and location of the installation. The depth of the trench shall be at least one-half inch per foot of fill height over the top of the conduit. **The minimum depth of excavation, regardless of fill height, shall be eight inches.** For example, if 18 feet of fill are required above the top of the pipe, the trench must be excavated to a depth of at least nine inches (1/2 inch x 18 = 9 inches). For 16 feet of fill or less, the minimum depth of the excavated trench shall be at least 8 inches. (For example, if 12 feet of

fill are required over the top of the pipe, even though 12 x 1/2 inch = 6 inches, the minimum depth of the excavated trench shall be at least 8 inches.)

When excavation must be below specified grade because of unsuitable, unstable foundation, unstable soil below established grade shall be removed and replaced. If there is no item for bedding material in the contract, the bottom of the trench shall be reconstructed with usable or selected soils conforming to Standard Specification 203.06. Replacement material shall be compacted as directed to at least the density of the surrounding soils. If bedding material is specified, the trench shall be excavated below grade and bedding material or granular material shall be placed and constructed in accordance with the requirements of Standard Specification Section 726. Even when bedding material is not specified, it may be necessary when unstable or unsatisfactory material is encountered. Examples of unsatisfactory or unstable material include excessive moisture content, high organic content, water seepage, soft materials, and excessive P.I. **When water seepage occurs, bedding material will be required. Clay seals are not an acceptable solution**.

When no trench is to be excavated, the contractor shall construct a uniformly firm bed on which to place the pipe. The bed shall be composed of usable or selected soils conforming to the requirements of Standard Specification Section 203, Subsection 203.06 and compacted as directed to at least the density of the surrounding soils.

SHORING

The contractor shall adhere to all state and federal guidelines in providing protection against the cave-in of any excavated area. The contractor shall not conduct operations in the trench unless adequate shoring is in place, when needed, all safety provisions are met, and all federal and state guidelines for protection are met. The safety of the excavation depends on the characteristics of the material in which the excavation is made, seepage, depth of excavation, and side slopes. Trenches shall be braced when needed to prevent the sloughing of side or top material. In all cases of apparent distress, or when the trench excavation exceeds 5 feet in depth, sloping, benching, and shoring will be required in accordance with the OSHA trench safety standards, 29 CFR s 1926.650, Subpart P. Consider these and any more stringent trench safety standards as minimum contract requirements. The contractor shall take all measures necessary to protect

workers in the trench area and shall provide them with safety equipment as needed. The design of shoring in no way affects the specification density requirements for the full width and depth of the trench.

CONSTRUCTION DETAILS

Soil and aggregate backfill material shall be of uniform characteristics and moisture content and shall be placed in lifts of uniform thicknesses. Lift thickness may require adjustment based on those characteristics, but shall not be increased above the specification requirements. Lift thickness shall be uniform, both vertically and horizontally, and shall be correlated with compactive effort to achieve specification density. The portions of any lifts in excess of specification requirements shall be removed and the lift recompacted. Backfill material shall be brought up evenly on both sides of the conduit for its full length in accordance with Standard Specification Section 701.

Before any construction equipment is allowed to cross the installed pipe, at least 2 feet, compacted thickness, of backfill shall be placed over the top. The backfill will help prevent the equipment from damaging the pipe or moving it out of alignment or flow line. If the final thickness of cover over the installed pipe is less than two feet, the contractor shall install the pipe after all heavy hauling has been completed. If it is not possible to install the pipe after the need to cross the line with heavy equipment, with the approval of the engineer, the contractor shall install the pipe and place excess material over the installed pipe to a compacted depth of at least two feet. After all heavy hauling is completed; the contractor shall remove the excess material to grade.

TOP OF PIPE EVEN WITH OR BELOW TOP OF TRENCH

When the top of the conduit is even with or below the top of the trench, backfill material shall be placed and compacted in lifts evenly on both sides of the conduit for its full length. The top of the compacted backfill shall be one foot above the top of the conduit or to subgrade (if less than one foot), or to natural ground elevation, whichever is greater.

TOP OF PIPE ABOVE TOP OF TRENCH

When the top of the conduit is above the top of the trench, backfill material shall be placed and compacted in lifts evenly on both sides of the conduit for its full length. The top of the compacted backfill shall be one foot above the top of the conduit or to subgrade, if the distance from the top of the conduit to the subgrade is less than one foot. Specification backfill material shall be used for backfilling the trench and as cover at least one foot above the pipe. The backfill shall extend on each side of the pipe for at least a distance equal to the outside diameter of the pipe.

QUALITY ASSURANCE

The project engineer will test to determine if the compaction and moisture requirements are met. The project engineer will take as many tests as necessary to ensure that each section of the backfill meets the density requirements.

When flowable fill is used as Type-A backfill, the documentation requirements for Flowable Fill Standard Specification Section 701 will apply.

	Density	**Moisture**
Type-A	Not Measured	Near OM%
Type-B		
Paved Area	95%*	Near OM%
Non-Paved Area	To the density of adjoining soils	Not Measured
• Density testing on backfill layers may be waived by the engineer when installation and performance have been continuously satisfactory		

MOISTURE DENSITY TESTING OF BACKFILL (ITEM 701)

702 - Manholes, Junction Boxes and Catch Basins

The scope of this section is limited to the earthwork associated with the installation of manholes, junction boxes, and catch basins.

Backfill materials and construction for manholes, junction boxes, and catch basins shall be in accordance with the general information under Standard Specification Section 701 Culverts and Storm Drains. If existing backfill has been saturated with water, it shall be removed, replaced, and recompacted.

Backfill placement and compaction shall be adjusted for the shape of the structure. If these structures are backfilled separately from adjoining conduit, existing backfill disturbed by the installation shall be removed, replaced, and recompacted.

QUALITY ASSURANCE

Quality Assurance, both Quality Control and Inspection and Acceptance, shall be conducted in accordance with Standard Specification Section 701.

802 - Structural Excavation and Backfill

Earthwork forms a part of the installation procedures of box culverts, retaining walls, foundations, and substructures. In order to ensure an adequate foundation for such structures, backfill material must meet certain specifications and be compacted by acceptable methods to adequate density. The use of poor soils as a bed for a structure and the failure to adequately compact soils surrounding any foundation can lead to premature failure.

Backfill shall be of acceptable quality, free from large or frozen lumps, wood, or other foreign material. No backfill shall be placed against a concrete abutment, wing-wall, or reinforced concrete box culvert until concrete has been in place at least 14 calendar days, or until test-cylinders made in accordance with DOTD TR 226, and tested in accordance with DOTD TR 230 have obtained a minimum compressive strength of 3000 psi.

The scope of this section is limited to the earthwork associated with the construction of structures.

SHORING

The contractor shall adhere to all state and federal guidelines in providing protection against the cave-in of any excavated area. The contractor shall not conduct operations in the trench unless adequate shoring is in place, when needed, all safety provisions are met, and all federal and state guidelines for protection are met in accordance with Standard Specification Section 701 and applicable sections of this manual.

BOX CULVERTS

The contractor shall excavate the trench wide enough to allow for construction activity. Generally, at least 18 inches on each side of the neat lines of the box will be adequate to allow for normal construction activity. The bottom of the excavation must be graded to match the flow line shown on the plans. The subgrade shall be compacted as necessary, when directed, to provide a firm foundation for the box culvert.

When suitable foundation cannot be obtained, unstable soil below plan grade shall be removed and the bottom of the excavation shall be reconstructed with specified soil conforming to Standard Specification Section 203, Subsection 203.06. If bedding material is specified or required, the excavation shall be excavated below grade and bedding material used to achieve plan elevation. Even when bedding material is not specified, it may be necessary when unstable or unsatisfactory material is encountered. Examples of unsatisfactory or unstable material include excessive moisture content, high organic content, water seepage, soft materials, and excessive P.I. **When water seepage occurs, bedding material will be required. A concrete seal may be permitted in lieu of bedding material at no direct pay. Clay seals are not an acceptable solution**. Replacement material shall be compacted as directed to at least the density of the surrounding soils.

Prior to the placement of forms or reinforcing steel in the box bottom, project personnel will check that the foundation follows the flow line slope as shown in the plans. It will also be visually inspected for uniformity of compaction, unstable areas, etc. The contractor shall correct deficiencies prior to proceeding with box culvert construction.

BACKFILLING

Box culverts shall be backfilled in accordance with Standard Specification Section 701, and in accordance with this manual.

COFFERDAMS AND CRIBS

Cribs and cofferdams shall be backfilled with soil, approved by the engineer, and compacted as directed to the satisfaction of the engineer. The finished elevation of the compacted backfill shall be that of the surrounding ground. Backfilling will continue to the surface of the surrounding ground, maintaining approximately equal elevations on both sides of the structure

FOOTINGS AND OTHER STRUCTURES

Final excavation to grade shall not be performed until just before the placement of reinforcing steel or concrete. When the bottom of the excavation is soil, the grade shall not be disturbed prior to the placement of concrete. When the bottom of the excavation is rock or other hard foundation material, it shall be cut to a firm surface as directed and all loose material removed. Any open seams shall be cleaned and filled with concrete, mortar, or grout to the satisfaction of the engineer. Footing excavations shall be dewatered and made as dry as possible prior to the placement of backfill. Backfill material as specified shall be placed in lifts not to exceed nine inches loose thickness as directed and uniformly compacted as directed to the satisfaction of the engineer.

No jetting of backfill behind abutments and wing-walls will be permitted.

QUALITY ASSURANCE

Quality Assurance, both Quality Control and Inspection and Acceptance, shall be conducted in accordance with Standard Specification Section 701.

APPENDIX

BORROW PIT SKETCH – EXAMPLE

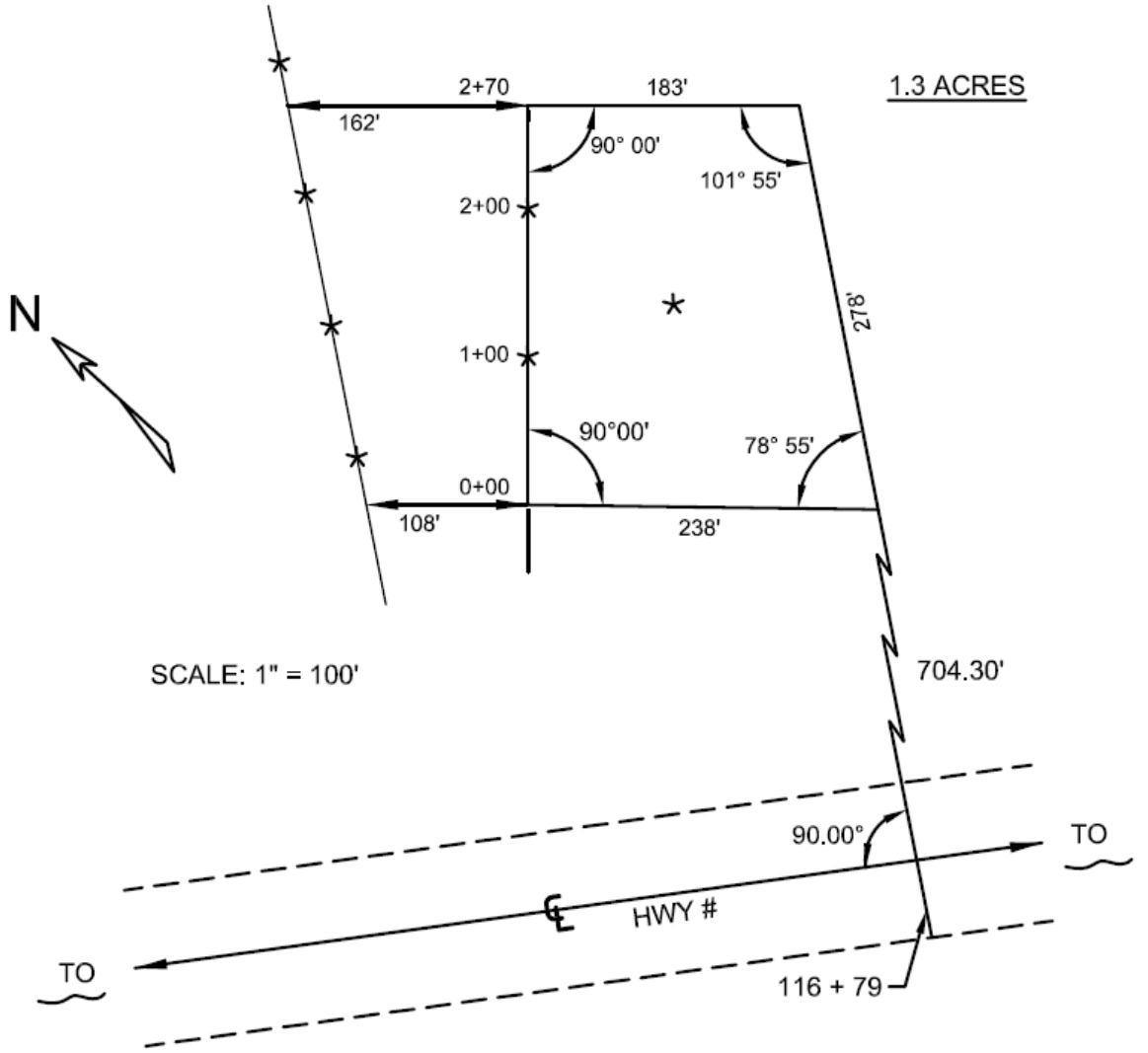
S. P. 000-00-0000

F.A.P. NO. 000-00-0 (000)

ROUTE No. ----------

"PIT NAME"

ANTICIPATED EXCAVATION DEPTH: _____

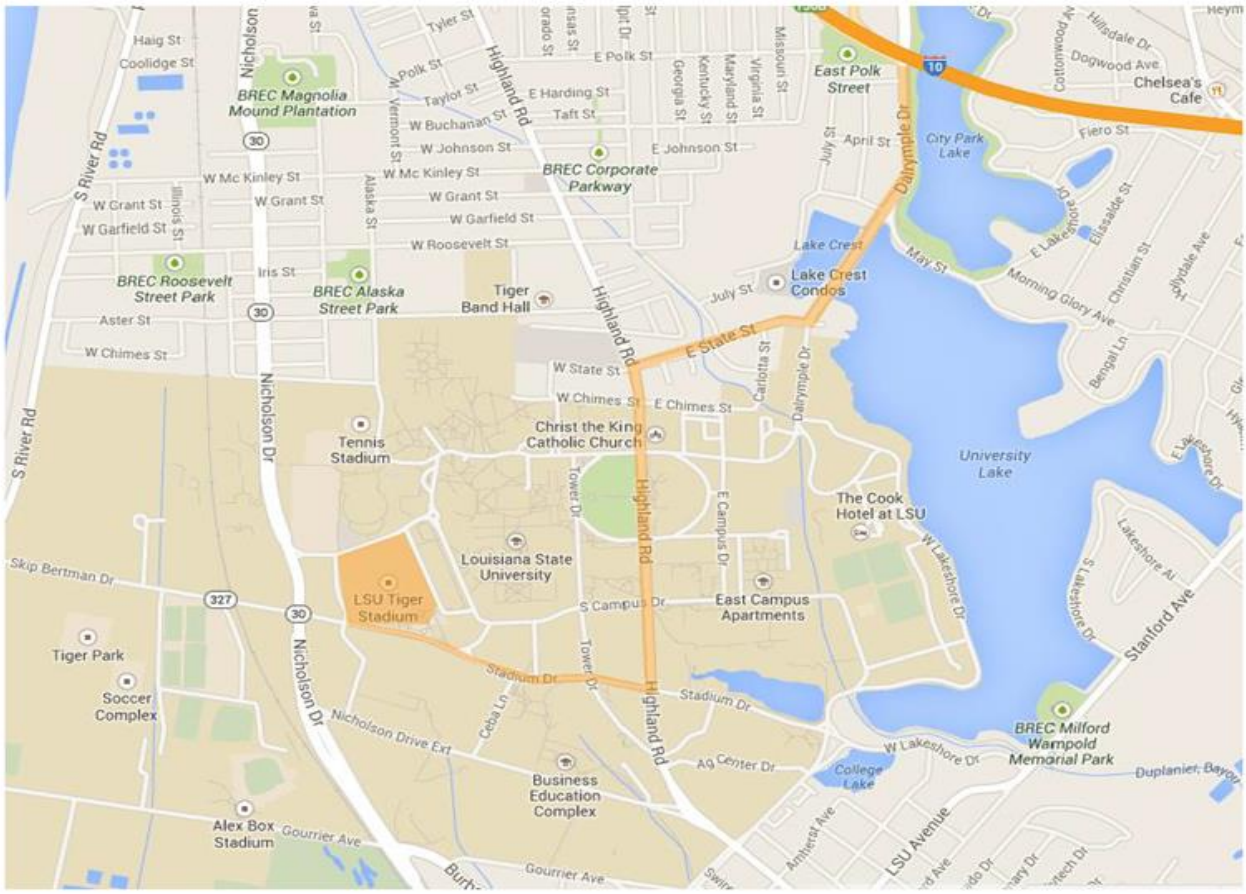


★ DO NOT WRITE IN THIS AREA. BORINGS WILL BE PLOTTED INSIDE THE PIT BOUNDARIES

BORROW PIT LOCATION MAP – EXAMPLE

Directions to pit location from I-10

-Dalrymple South to Highland
-South on Highland to Stadium Dr.
-West on Stadium Dr. to large oval structure marked with purple and gold flagging
- Enter pit from West gate and proceed to grassy area marked in 10 yd. increments



RIGHT OF ENTRY

DATE

STATE PROJECT NO. _____
F.A.P. NO. _____
_____
ROUTE _____
_____ PARISH
PARCEL NO. (S) _____

The undersigned does hereby grant, authorize, and convey unto the Louisiana Department of Transportation and Development, its Agents, Engineers, and/or Contractors, the right to enter upon the property located LOCATION OF THE PROPERTY TO BE ENTERED adjacent to the right of way of the captioned project for the purpose of PURPOSE OF THE RIGHT OF ENTRY and to perform all related activities necessary for completion of the work herein authorized in said area.

This Right of Entry is granted with the provision that the Department of Transportation and Development will correct all damages resulting from its construction activities on the property of the undersigned.

It is further understood and agreed that this right of entry is irrevocable and cannot be rescinded, and that the Department of Transportation and Development does hereby hold harmless the undersigned for any and all damages or claims resulting from said construction.

WITNESSES:

_____

_____
OWNER

_____

_____

_____
OWNER NAME

_____

_____

_____
(Type or write the name of ROW admin here)
RIGHT OF WAY ADMINISTRATOR

_____

CERTIFICATE OF RELEASE

STATE PROJECT NO.: _____ FAP NO.: _____
HIGHWAY: _____
PARISH: _____

Know all men by these presents that I hereby accept the following described work performed by _____ which consists of _____ _____ from the right of way of the _____ State Highway Route No. _____ and located at station _____ _____.

I further renounce and waive every right or claim for damages against the Louisiana Department of Transportation and Development, its agents and/or contractors, arising out of the above-described work.

Witness my hand this _____ day of _____, 20_____.

WITNESS:

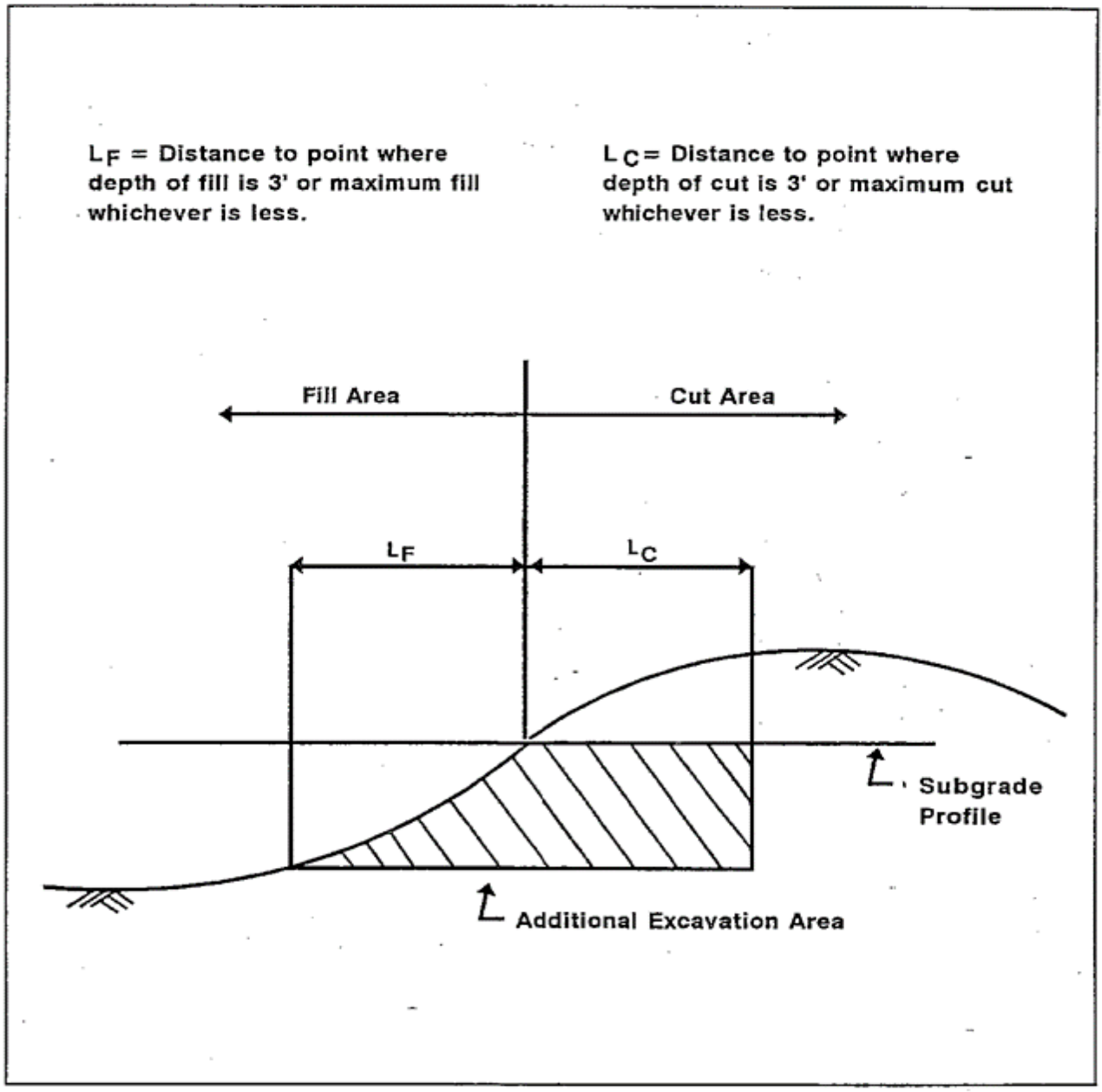
_____

_____ _____
Owner or Legally Authorized Representative

I hereby certify that I have personally examined the above-described work and find same to have been performed in a satisfactory and workmanlike manner.

_____
Project Engineer

TRANSITION FROM CUT TO FILL



CERTIFICATE OF MATERIAL PROPORTIONS FOR BASE COURSE
FORM 03-22-0751

DOTD 03-22-0751
12/94

Louisiana Department of Transportation and Development

CERTIFICATE OF MATERIAL PROPORTIONS FOR BASE COURSE

Project No. Time am/pm Date _____

Load No. Truck No. Plant Lot No. _____

Plant Batch _____ Continuous

Legal Load yd³ lb Temp. _____ Design No. _____

_____
Contractor Batcher

Test Data - Contractor's Quality Control

Test Number: _____ Test Time: _____ am/pm

Pulverization _____ % Water Added gal/lb Moist. Content %

Additive/Lime Rate % (TR 436) Cement Rate _____ % (TR 436)

Weights

Material 1 _____ Material 2 _____ Material 3

Additive/Lime Cement _____ Total Batch Wt

Meets Design ☐ yes ☐ no

_____
Contractor's Certified Technician

Roadway Data

Location Placed: _____ Time Placed: _____

Section Number: _____ Cu Yd (Vehicle Measurement) _____

Beginning Station: _____ Ending Station _____

Plan Width: _____

_____
DOTD Certified Inspector

DENSITY AND MOISTURE CONTENT WORKSHEET
FORM 03-22-0750

MATT MENU SELECTION - 07

Louisiana Department of Transportation and Development
DENSITY & MOISTURE CONTENT WORK SHEET

DOTD 03-22-0750
Metric/ English
Rev. 12/98

Metric/English (M or E) ___ *(Entry Field Located on Menu)*

Project No. ___ **Date Tested** ___ **Material Code** ___
Submitted By ___ **Purpose Code** ___ **Spec. Code** ___
Test Method ___ *N = Nuclear S = Sand Cone* **Item Number** ___
Station Tested ___ + ___ **Section & Test No.** ___

Location: _____ Lift No: _____ Depth of Test: _____

OM:	Optimum % Moisture Content of Total Material **(TR 415 or TR 418)**	OM	
%FM:	Field % Moisture Content at Compaction **(TR 403)** *(See back for calculations)*	%FM	
P_1:	% Pulverization **19mm (3/4" SIEVE) (TR 431)** *(See back for calculations)*	P_1	
P_2:	% Pulverization **4.75mm (NO.4 SIEVE) (TR 431)** *(See back for calculations)*	P_2	

(TR 415) Cross Reference Test No.	Sta. No.:		**Max. Dry Density Method** ___ *(1 = TR 415 A 2 = TR 415 B 3 = TR 418)*
a: Total Wet Mass (Wt.) of Sample			
b: Mass (Wt.) of +4.75 (+4) Material			
c: % By Mass (Wt.) of 4.75 (+4)Retained **(100 b/a)**			
d: Mass (Wt.) of Mold & Soil			
e: Mass (Wt.) of Mold			
f: Mass (Wt.) of Compacted Soil **(d - e)**			
g: Wet Density **(f / 0.944)** or **(f / 2.832)** or **(f / 2.124)** **(f x 30)** or **(f x 10)** or **(f / 0.075)**			
h: Mass (Wt.) of Wet Soil			
i: Mass (Wt.) of Dry Soil			
j: Mass (Wt.) of Water **(h - I)**			
k: % Moisture Content **(100 j/I) (TR 403)**			
l: Dry Density **100g / (100 + k)**			

om *(from Family of Curves)*: _____ pr *(from Family of Curves)*: _____ **FAMILY OF CURVES ZONE NUMBER** ___

SAND METHOD (TR 401)	
SA: Mass (Wt.) of Sand in Mold	
SB: Vol. of Mold	
SC: Unit Mass (Wt.) of Sand **(SA/SB)**	
SD: Orig. Mass (Wt.) of Sand	
SE: Final Mass (Wt.) of Sand	
SF: Mass (Wt.) of Sand in Cone **(SD-SE)**	
SG: Orig. Mass (Wt.) of Sand	
SH: Final Mass (Wt.) of Sand	
SI: Mass (Wt) of Sand in Cone & Hole **(SG-SH)**	
SJ: Mass (Wt.) of Sand in Hole **(SI-SF)**	
SV: Vol. of Hole **(SJ/SC)**	
SW: Dry Mass (Wt.) of Material	
SDD: Dry Density **(SW / SV)**	
PR: Maximum Dry Dens. **(TR 415 / TR 418)**	
%PR: % Density (Sand) **(SDD / PR) x 100**	

NUCLEAR METHOD (TR 401)		Test 1	Test 2	Test 3
Nuclear Device Number ___ **Insp. (Nuclear Badge No.)** ___				
DS:	Density Standard Count			
DC:	Density Test Count			
DR:	Density Count Ratio **(DC / DS)**			
WD:	Wet Density			
MS:	Moisture Standard Count			
MC:	Moisture Test Count			
MR:	Moisture Count Ratio **(MC / MS)**			
M:	Moisture by Mass (Wt.)			
MP:	Moisture by Percent - *TR 401* ☐ / *TR 403* ☐			
NDD:	Dry Density **(WD - M)** or $\frac{100 \times WD}{100 + MP}$			
%NPR:	% Density **(NDD / PR) x 100**			
ADD:	Average Dry Density **(NDD) or (NDD/3)**			
PR:	Maximum Dry Density **(TR 415/TR 418)**			
%PR:	% Dens.(Nuclear) **(% NPR) or (% NPR/3)**			

Remarks ___

_____ *(Signature)*

DENSITY AND MOISTURE CONTENT WORKSHEET

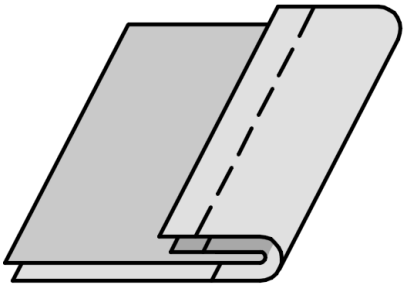
FORM 03-22-0750

Pulverization, P_1 and P_2 (TR 431)					
* Test No. * *Utilize as many columns as necessary per test section.*		1	2	3	4
Adjusted Wet Mass (Wt) Sample (A)					
Mass (Wt) of + 19 mm (3/4 in) Material (B_1)					
Mass (Wt) of + 4.75 mm (No. 4) Material (B_2)					
% Pulverization 19 mm (3/4 in) (P_1)	$100 \times \frac{(A - B_1)}{A}$				
% Pulverization 4.75 mm (No. 4) (P_2)	$100 \times \frac{A - (B_1 + B_2)}{A}$				

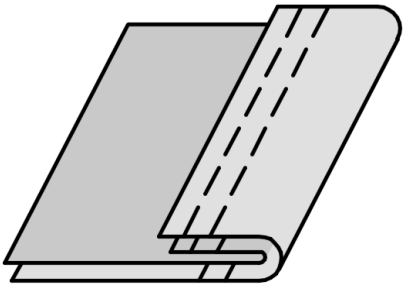
Field Moisture Content at Compaction, % FM (TR 403)					
* Test No. * *Utilize as many columns as necessary per test section.*		1	2	3	4
Total Wet Mass (Wt) of Matl. at Compaction (A)					
Total Dry Mass (Wt) of Matl. at Compaction (B)					
Mass (Wt) of Water (C)	$(A - B)$				
% Field Moisture Content (% FM)	$100 \times \frac{C}{B}$				

Optimum Moisture and Maximum Dry Density Adjustments for Material Containing 20% - 60 % Siliceous Aggregate (TR 415)				
		1	2	3
Optimum % Moist. of Tot. Material, (OM)	$OM = [(\frac{100 - c}{100}) \times om] + \frac{c}{100}$			
Maximum Dry Density, lb/ft³ (PR) *(English)*	$PR = \frac{160 \times pr \times z}{\frac{c}{100} \times pr \times z + [160 \times (1 - \frac{c}{100})]}$			
Maximum Dry Density, kg/m³ (PR) *(Metric)*	$PR = \frac{2564 \times pr \times z}{\frac{c}{100} \times pr \times z + [2564 \times (1 - \frac{c}{100})]}$			

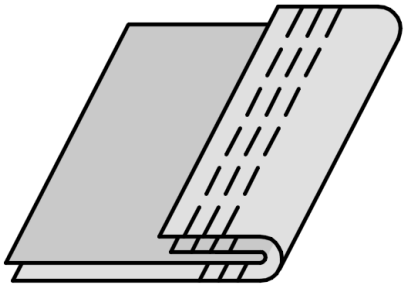
J-STITCH FOR GEOTEXTILE FABRIC



SSn-1



SSn-2



SSn-3

INSPECTION REPORT – ARCHAELOGICAL OR HAZARDOUS MATERIALS (EDSM III.1.1.22)

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

REPORT OF INSPECTION

Print, do not type, this report. Prepare five copies.

STATE PROJECT NO.	FAP NUMBER

PROJECT NAME (Route number and parish name not required.)

The location described below and shown on the attached map was surveyed for evidence of cultural artifacts, archaelogical and historical material.

Evidence of such material ☐ was ☐ was not found.

Intended use of this site ☐ borrow ☐ muck disposal.

The contractor ☐ does ☐ does not intend using this site.

If evidence of such material was found, by copy of this report it is hereby requested that the Public Hearing and Environmental Section promptly make a determination of significance in accordance with EDSM III. 1. 1. 22.

SIGNED NAME	TITLE
PRINTED NAME	TELEPHONE NUMBER

DISTRIBUTION
Original - Project Engineer
Copy - Project Engineer
Copy - Public Hearing and Environmental Section
Copy - Construction Section
Copy - Retain for your records

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT EDSM No: III.1.1.22

ENGINEERING DIRECTIVES AND STANDARDS

Volume : III Revision Date : 10/24/1986
Chapter : 1 Subject : **PROCEDURE FOR REPORTING THE INSPECTION OF BORROW & MUCK DISPOSAL AREAS FOR CULTURAL ARTIFACTS, ARCHAEOLOGICAL AND HISTORICAL SITES**
Section : 1
Directive : 22

1. **PURPOSE**. The purpose of this directive is to restate the procedure for the inspection and evaluation of borrow pit and muck disposal areas for cultural artifacts, archaeological and historical sites and the reporting of the results of the inspection and evaluation.

2. **SCOPE**. This directive outlines the procedures to be followed in this inspection, evaluation and reporting.

3. **PROCEDURE**. District personnel are to be trained as to what visual observations are to be made and the following procedure shall be followed in reporting:

   A. **BORROWPITS**

      (1) The district laboratory boring crews will inspect the proposed borrow pit site and transmit their findings along with the test reports on the borings to the project engineer. (Use attached form.)

      (2) If negative findings, the project engineer will transmit the negative findings to the contractor along with the results of the soil tests and approval of the borrow pit location.

      (3) On questionable sites, the Department's Public Hearings and Environmental Section will make a determination of the significance of the site. A report of their findings shall be transmitted to the project engineer, with copy to the Construction Section.

      (4) If the findings of the environmental section are negative, or positive but with no significance, the project engineer shall notify the contractor in accordance with procedure A(2)(above).

      If significant findings are discovered, the project engineer shall so notify the contractor in writing, and disapprove the proposed borrow pit.

      (5) During construction, project personnel are to make visual observation of the material removed from the borrow pits as this material is placed on the project and are to immediately report any findings to the Department's Public Hearings and Environmental Section. As provided by the Standard Specifications, the contractor's operations are to be

   B. **MUCK DISPOSAL AREAS**

      (1) Project personnel shall inspect the proposed muck disposal area and transmit negative findings to the contractor. (Use attached form.)

      (2) On questionable sites, the Department's Public Hearings and Environmental Section will make a determination of the significance of the site, furnishing a report of their findings to the project engineer (for transmittal to the contractor), with copy to the Construction Section. In the event significant findings are discovered, the contractor shall not be permitted to deposit muck in the discovery area.

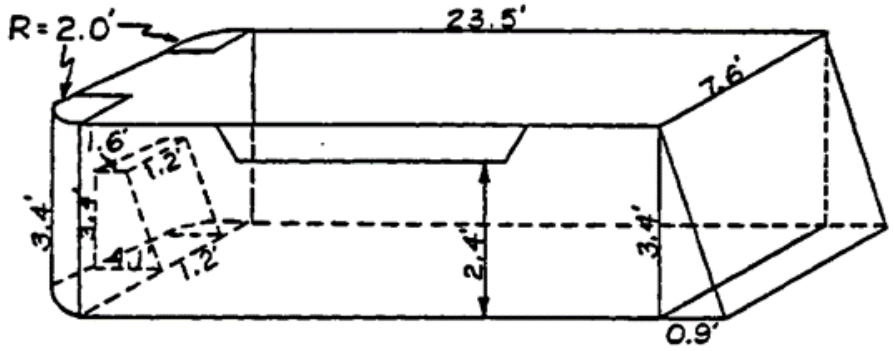
4. **OTHER ISSUANCES AFFECTED**. This directive supersedes EDSM 111.1.1.22 dated September 18, 1978. All directives, memoranda or instructions issued heretofore in conflict with this directive are hereby rescinded.

5. **EFFECTIVE DATE**. This directive shall be effective upon receipt.

P. J. FREDERICK
CHIEF CONSTRUCTION ENGINEER

ATTACHMENT B - Form 1
EDSM III.1.1.12
Page 10 of 14 - 3/86

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
TRUCK WEIGHT AND VOLUME CERTIFICATION - FORM NO. 1



Mark out hydraulic box, if not present.

CERTIFICATION TAG NO. 08-144
DESCRIPTION: MAKE Mack YEAR 1971
SERIAL NO. (TRACTOR) B672ST-21163 (If applicable)
SERIAL NO. (TRAILER) 47969 (If applicable)
TRUCK TYPE 6
STEERING AXLE TIRE SIZE 10:00
MAXIMUM VOLUME 24,188 yds.^{3}
LEGAL GROSS WEIGHT 80,000
TARE WEIGHT 27,500
LEGAL PAYLOAD 52,500
TARE WEIGHT: AXLE NO. 1 _____
2 _____
3 _____
4 _____
5 _____
6 _____ TOTAL: _____
REMARKS _____

MEASURED BY _____ DATE _____
WEIGHED BY _____ DATE _____

DOTD 03-22-3050
Compaction Equip.
Rev. 06/02
Page 3 of 3

State of Louisiana
Department of Transportation and Development

ASPHALTIC CONCRETE PAVING EQUIPMENT CERTIFICATION

Compaction Equipment

Make: _____ Serial No: _____
Certification Tag: _____ Date: _____
Expiration Date: _____

Roller Type: ☐ vibratory ☐ pneumatic ☐ 3-wheel steel Cert. Wt.
☐ tandem wheel steel ☐ combination _____

General ☐ watering devices ☐ scrapers ☐ ballast system
☐ self-propelled ☐ reversible ☐ changes direction without backlash
☐ clean ☐ devices in good working condition

Steel Wheeled Rollers ☐ smooth surfaced wheels ☐ wheels - true round without flat spots
wheel width _____ wheel diameter _____

Vibratory Rollers ☐ smooth surfaced wheels ☐ wheels - true round without flat spots
wheel width _____ wheel diameter _____
☐ amplitude & frequency independently & easily adjustable
☐ amplitude & frequency easily readable on control panel

Pneumatic Roller No. of tires: _____ wt. per tire: _____ ply: _____ side:
☐ tire replacement as per manufacturer's specifications
☐ all tires of same size, ply, inflation & diameter
☐ manufacturer's calibration charts for contact pressure available
☐ air pressure sufficient for proper contact pressure

Remarks _____
_____
_____
_____

_____ _____
District Laboratory Representative **Date**

_____ _____
Project Engineer Representative **Date**

APPROVED BY: _____ _____
District Laboratory Engineer **Date**

DISTRIBUTORS
EQUIPMENT INSPECTION AND CERTIFICATIONS

DOTD 03-22-3050
Rev. 06/02
Page 1 of 3

State of Louisiana
Department of Transportation and Development

ASPHALTIC CONCRETE PAVING EQUIPMENT CERTIFICATION

Asphalt Distributor

Make: _____ Serial No: _____
Certification Tag: _____ Date: _____
Expiration Date: _____

General ☐ condition acceptable ☐ no fluid or fuel leaks that could contaminate mat
Heating System ☐ burners working properly ☐ tack kept at proper temperature
Thermometer *Type:* ☐ armored ☐ dial ☐ other _____
☐ acceptable accuracy ☐ current location _____
Measuring System *Type:* ☐ gauge ☐ graduated measuring stick
☐ other _____
Metering System ☐ Tachometer - acceptable (ft/min) ☐ Flow Control Device (gal/min)
☐ Calibration Charts available

Distribution System *Pump:* ☐ working properly ☐ uniform pressure & flow of material
Screens: ☐ not clogged
Spray Bar: ☐ nozzles not clogged ☐ uniform application rate of material

WEIGHT CERTIFICATION TAGS ☐ condition acceptable
number: _____ tare weight: _____ allowable load _____

Remarks _____
_____
_____
_____

_____ _____
District Laboratory Representative **Date**

_____ _____
Project Engineer Representative **Date**

APPROVED BY: _____ _____
District Laboratory Engineer **Date**

PLANT EQUIPMENT – CERTIFICATION STICKER
EQUIPMENT INSPECTION AND CERTIFICATIONS

LOUISIANA DEPARTMENT
OF
TRANSPORTATION AND DEVELOPMENT
INSPECTION CERTIFICATE

Plant: _____

Location: _____

Type: _____

Date Certified: _____

Truck or Unit No.: _____

Inspected by: _____

This certificate will be valid for a period of two years if not revoked for noncompliance.

Base Course Central Mix Plant Certification Report (03-22-0753)

DOTD 03-22-0753
Page 1 of 6
12/94

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BASE COURSE CENTRAL MIX PLANT CERTIFICATION REPORT

District: _____

Plant: _____ Name _____ Number

_____ Name _____ Matt Plant Code

_____ Make _____ Model/Serial No.

_____ Location _____ Parish

_____ Owner

_____ Mailing Address

Plant Type: ☐ Batch ☐ Continuous Capacity: _____ Yd³/Hr _____ Tons/Hr

Date: _____

Remarks: _____

_____

Inspected By: _____ Signature Date:

Approved By: _____ District Laboratory Engineer Date:

MATERIAL STORAGE AND HANDLING

SOILS, AGGREGATES, OR SOIL/AGGREGATES

STOCKPILES Building Method: ☐ Dozer ☐ Loader ☐ Dragline Other: _____ Describe

Remarks: _____

_____

Material:			**Material:**		
Approved Source:	☐ yes	☐ no	Approved Source:	☐ yes	☐ no
Satisfactory Drainage:	☐ yes	☐ no	Satisfactory Drainage:	☐ yes	☐ no
Separation:	☐ spacing	☐ partitions	Separation:	☐ spacing	☐ partitions
Contamination:	☐ yes	☐ no	Contamination:	☐ yes	☐ no
Segregation:	☐ yes	☐ no	Segregation:	☐ yes	☐ no
Uniform:	☐ yes	☐ no	Uniform:	☐ yes	☐ no

SOILS, AGGREGATES, OR SOIL/AGGREGATES (Continued)

Material: _____ **Material:** _____

Approved Source: ☐ yes ☐ no Approved Source: ☐ yes ☐ no

Satisfactory Drainage: ☐ yes ☐ no Satisfactory Drainage: ☐ yes ☐ no

Separation: ☐ spacing ☐ partitions Separation: ☐ spacing ☐ partitions

Contamination: ☐ yes ☐ no Contamination: ☐ yes ☐ no

Segregation: ☐ yes ☐ no Segregation: ☐ yes ☐ no

Uniform: ☐ yes ☐ no Uniform: ☐ yes ☐ no

Remarks: _____

CEMENT

Approved Source: ☐ yes ☐ no

Number of Storage Silos: _____ Adequate: ☐ yes ☐ no

Cements in Same Silo from Same Source: ☐ yes ☐ no

Cements From More Than One Source In Storage: ☐ yes ☐ no

Remarks: _____

LIME

Type: ☐ Hydrated ☐ Pelletized Quicklime ☐ Slurry

Approved Source: ☐ yes ☐ no Approved Blending Process: ☐ yes ☐ no

Remarks: _____

Other Additives: Type:

Approved Source: ☐ yes ☐ no Approved Blending Process: ☐ yes ☐ no

Remarks: _____

WATER

Potable: ☐ yes ☐ no Approved Source: ☐ yes ☐ no

Remarks: _____

Base Course Central Mix Plant Certification Report (03-22-0753)

DOTD 03-22-0753
Page 3 of 6
12/94

STORAGE EQUIPMENT

BINS: Loading Method: ☐ dragline ☐ loader ☐ belt conveyor

Other: _____

Number of Bins: _____

Partitions Extend 1 Ft Above Bins:	☐ yes	☐ no	☐ N/A
Individual Bin For Each Material:	☐ yes	☐ no	
Number of Bins Adequate for Production:	☐ yes	☐ no	
Designed for Efficient Discharge:	☐ yes	☐ no	
No Material Accumulation In Corners:	☐ yes	☐ no	
Free of Holes:	☐ yes	☐ no	
Load Without Segregation:	☐ yes	☐ no	
Discharge Without Segregation:	☐ yes	☐ no	
Vibrators Working:	☐ yes	☐ no	☐ N/A
Bins Leak Free:	☐ yes	☐ no	
Automatic Cutoff for Material Flow Interruption:	☐ yes	☐ no	

Type of Discharge Gate: ☐ clam shell ☐ other
(overhead storage bins) _____
Describe Other

Individual Cold Feed Gates:

Rectangular:	☐ yes	☐ no
Positive Mechanized Adjustment:	☐ yes	☐ no
Locks in Position:	☐ yes	☐ no

Proportioning by Cold Feed: ☐ Applicable ☐ Not Applicable
Determined by: ☐ Belt Speed ☐ Gate Opening

Calibration Curve/Each Bin per Material Type Used:	☐ yes	☐ no
Automatic Shut-off on Each Bin:	☐ yes	☐ no
Adjusted & Operating Correctly:	☐ yes	☐ no
Platforms and Ladders Safe and Adequate:	☐ yes	☐ no

Remarks: _____

SILOS: Number of Silos: _____ Capacity of Each: _____ (tons)

Weatherproof:	☐ yes	☐ no
Holes:	☐ yes	☐ no
Individual Silo For Each Material:	☐ yes	☐ no
Number of Silos Adequate for Production:	☐ yes	☐ no
Designed for Efficient Discharge:	☐ yes	☐ no
Vibrators:	☐ yes	☐ no
Air:	☐ yes	☐ no
Feed Controlled to Proper Percentage:	☐ yes	☐ no
Leaks:	☐ yes	☐ no
Excessive Dusting:	☐ yes	☐ no
Platforms and Ladders Safe and Adequate:	☐ yes	☐ no

Remarks: _____

Base Course Central Mix Plant Certification Report (03-22-0753)

CONVEYOR SYSTEMS

Adequately Transport Materials:	☐ yes	☐ no
Spillage:	☐ yes	☐ no
Holes or Tears in Belts:	☐ yes	☐ no
Platforms & Ladders - Meet Safety Standards:	☐ yes	☐ no
- Cover Inspection Points:	☐ yes	☐ no
Material Diversion System (each component):	☐ yes	☐ no

Remarks: _____

MEASURING DEVICES*

	Water	Cement	Lime	Soils/Aggregate	Additive
Make					
Type					
Capacity					
Graduation					
Date Calibrated					
Max. Error, %					

Protected:	☐ yes	☐ no
Clean:	☐ yes	☐ no
Zero:	☐ yes	☐ no
Visible to Operator:	☐ yes	☐ no
Certification Report for Scales & Meters on File:	☐ yes	☐ no
Water Measuring Device Accurate to 1% of Measured Quantity:	☐ yes	☐ no
Water Meter - Maximum Graduation is 1 gal:	☐ yes	☐ no
Additives measured to 3% of required weight:	☐ yes	☐ no

Remarks: _____

* *Volumetric Calibrations will be documented in a field book.*

PLATFORM SCALES

Make: _____ Capacity: _____ (tons)

Date Calibrated: _____ Maximum Error, %:

Type Panel Indicated: _____

Sufficient Length to Weigh Entire Unit at One Time:	☐ yes	☐ no
Prints Tare Weight:	☐ yes	☐ no
Prints Total Weight of Mixture:	☐ yes	☐ no
Prints Total Weight of Mixture & Unit:	☐ yes	☐ no

Remarks _____

Base Course Central Mix Plant Certification Report (03-22-0753)

PUGMILL

Type: ☐ Batch ☐ Continous

Rated Capacity: _____ cu yd/hr

Number of Shafts: _____

Mixing Time (Batch): _____ raw

Mixing Time (Batch): _____ w/ cement _____ w/lime

Paddles All In Place:	☐ yes	☐ no
Paddles In Good Condition:	☐ yes	☐ no
Liner In Good Condition:	☐ yes	☐ no
Spray Bar Operating:	☐ yes	☐ no
Uniform Moisture/Cement Blend:	☐ yes	☐ no
Mixes Without Segregation:	☐ yes	☐ no
Platforms and Ladders Safe and Adequate:	☐ yes	☐ no
No Gate Leaks: (Batch Plant Only)	☐ yes	☐ no
Positive Gate Lock During Mixing: (Batch Plant Only)	☐ yes	☐ no
Soil/Aggregate Feeder Interlocked with Cement, Additives & Water Feed:	☐ yes	☐ no

Remarks: _____

_____

SAMPLING PLATFORM

Sturdy:	☐ yes	☐ no
Acceptable Location:	☐ yes	☐ no
Safe:	☐ yes	☐ no
Satisfactory:	☐ yes	☐ no

Remarks: _____

_____

PLANT LABORATORY

Size: Length _____ ft Width ft Area sq ft

Number of Doors: _____ No. of Windows:

Base Course Central Mix Plant Certification Report (03-22-0753)

PLANT LABORATORY (Continued)

Acceptable Location:	☐ yes	☐ no
Proper Construction:	☐ yes	☐ no
Dedicated to Testing Personnel/DOTD & Contractor:	☐ yes	☐ no
Air Conditioned:	☐ yes	☐ no
Heated:	☐ yes	☐ no
Weatherproof:	☐ yes	☐ no
Adequate Power Outlets:	☐ yes	☐ no
Adequate Electric Lights:	☐ yes	☐ no
Fume Hood With Exhaust Fan Suitably Located:	☐ yes	☐ no
Running Water:	☐ yes	☐ no
Desks, Work Benches, Chairs, File Cabinets:	☐ yes	☐ no
Approved Sanitary Facilities (toilet & basin):	☐ yes	☐ no
Quality Control Equipment:	☐ yes	☐ no
Suitable Locks With Keys:	☐ yes	☐ no

Remarks: _____

TESTING EQUIPMENT

All contractor's testing equipment calibrated and approved in accordance with current DOTD requirements:

☐ yes ☐ no

All equipment in-place and approved prior to production: ☐ yes ☐ no

PERFORMANCE

Plant produces mixture that meets specifications: ☐ yes ☐ no

Remarks: _____

Base Course Central Mix Plant Certification Report (03-22-0753)

PLANT EQUIPMENT – CERTIFICATION REPORT FOR SCALES AND METERS (03-22-3065)

EQUIOPMENT INSPECTION AND CERTIFICATIONS

DOTD 03-22-3065
Rev. 10/93

Department of Transportation and Development

CERTIFICATION REPORT FOR SCALES AND METERS

Plant Name _____ Location _____ Date _____

Plant Type: ☐ Portland Cement Concrete ☐ Asphaltic Concrete ☐ Other _____

Type Measurement Device: ☐ Springless Dial ☐ Load Cell ☐ Beam ☐ Platform
☐ Belt ☐ Meter ☐ Other _____

Material Measured: ☐ Asphalt ☐ Anti-Strip ☐ Water ☐ Aggregate: ☐ Coarse ☐ Fine
☐ Cement ☐ Filler ☐ Admix ☐ Other _____

Make of Device: _____ Capacity _____ Minimum Gradations _____

Serial No. (Identification) _____ Electronic Readout ☐ Yes ☐ No

Actual Amount	Reading Amount	Percent Error	Actual Amount	Reading Amount	Percent Error	Actual Amount	Reading Amount	Percent Error

Maximum Error _____ %

I certify that this measuring device meets the certification requirements of the Louisiana DOTD.

Certifying Company: _____

LA State License No: _____

Expiration Date: _____

_____
Technician and LA License No.

All scales and other measuring devices utilized at plants supplying materials to DOTD are to be certified by an independent company every 90 days or as required by the engineer. This report is to be completed by the certifying company's representative for each measuring device for each material. One copy is to be filed in plant records readily available to department personnel. One copy is to be sent to the DOTD District Laboratory Engineer.

BASE COURSE DESIGN FOR CENTRAL PLANT MATERIALS MIXTURES (03-22-0752)

EQUIPMENT INSPECTION AND CERTIFICATIONS

DOTD 03-22-0752
12/94

Louisiana Department of Transportation and Development

BASE COURSE DESIGN
FOR CENTRAL PLANT MATERIALS MIXTURES

Project No. ____-____-____ Plant Code B ____ Mat Code ____ Seq. No. ____

Plant Type ____ (1 = Batch, 2 = Continuous) Base Course Class ____ Base Course Type _____

FAP No. _____ Proj. Name _____

Proj. Engr. _____ Contractor _____

Production Rate: ____ lb/batch ____ tons/hr ____ yd³/hr

Materials

	Code	Source		Batch Wt. (for Batch Plant Operations)	Feed Rate (lb/min) (for Continuous Plant Operations)	% Weight
MATERIAL 1	____	____	_____	_____	_____	____.____
MATERIAL 2	____	____	_____	_____	_____	____.____
MATERIAL 3	____	____	_____	_____	_____	____.____
CEMENT	____	____	_____	_____	_____	____.____
LIME/ADDITIVE	____	____	_____	_____	_____	____.____
						100.0%

Gradation

Sieve Size	Material 1 _____, % % Passing	Material 2 _____, % % Passing	Material 3 _____, % % Passing	Contractor % Passing	DOTD % Passing
2 1/2	_____	_____	_____	____	
1 1/2	_____	_____	_____	____	____
1	_____	_____	_____	____	____
3/4	_____	_____	_____	____	____
No. 4	_____	_____	_____	____	____
No. 10	_____	_____	_____	____	____
No. 40	_____	_____	_____	____	____
No. 200	_____	_____	_____	____	____

DOTD Results

Max. Dry Weight Density, lb/ft³ ____.____ Optimum Moisture, % ____.____ Cement, % ____.____

Unit Wt. of Additive _____ Lime, % ____.____

Date First Used ____-____-____ Additive, % ____.____

Remarks 1 _____

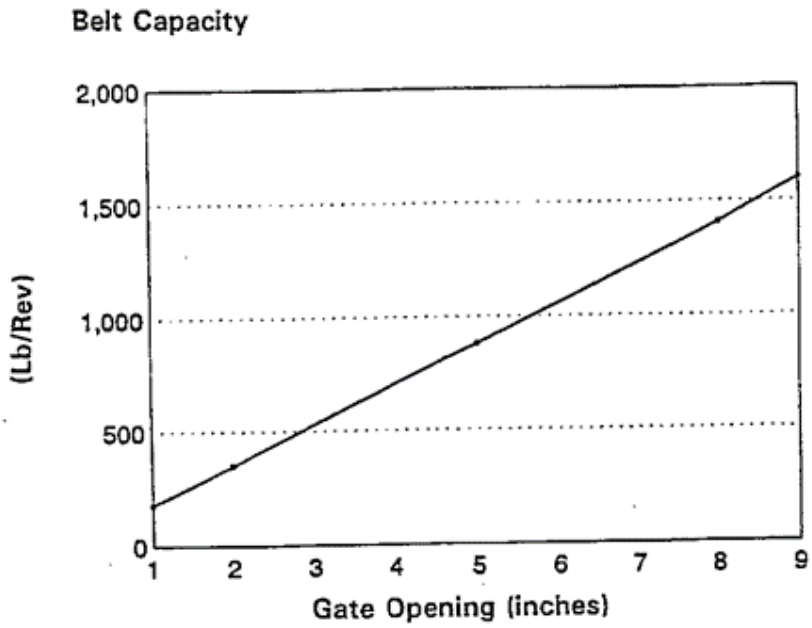
_____

Submitted By ____ _____ Date ____-____-____

Checked By _____ Date ____-____-____

Approved ____ (yes / no) Date ____-____-____

Approved By ____ _____
District Laboratory Engineer



Belt Width	18"	Unit Weight	117.3 lb/ft^3
Belt Length	12′	G = Gate Opening (ft)	

$$\frac{18''}{12} = 1.5'$$

$$1.5 \text{ ft} \times 12 \text{ ft/rev} \times G \text{ ft} = \frac{18.0\ (G)\ \text{ft}^3}{\text{rev}}$$

$$\frac{(18.0 \times G)\ \text{ft}^3}{\text{rev}} \times \frac{117.3\ \text{lb}}{\text{ft}^3} = 2111.4\ (G)\ \text{lb/rev}$$

$G = 2''$ $\quad 2111.4 \times \frac{2}{12} = 351.9$ lb/rev

$G = 5''$ $\quad 2111.4 \times \frac{5}{12} = 880.5$ lb/rev

$G = 8''$ $\quad 2111.4 \times \frac{8}{12} = 1408.3$ lb/rev

DOTD 03-22-0754
12/94

Louisiana Department of Transportation and Development
DAILY CENTRAL MIX PLANT REPORT

Project No. ___-___-___ Plant Code B___ Mat Code ___ Seq. No. ___
Project No. ___-___-___ Lot No. ___ Date ___-___-___
Project No. ___-___-___ Purp. Code ___ Class ___ 1 = Class 1, 2 = Class 2, 3 = In-Place Stabilized

Base Course Type _____ Weather: High _____ Low _____

Mix Design			
Material		Source	Proportions By Weight
Material #1			
Material #2			
Material #3			
Lime/Additive			
Cement			
Total			100 %

Proportion Check (TR 436)						
Material	No. 1	No. 2	No. 3	Additive/Lime	Cement	Total
Test No. 1 Sampling Time Period:						
Wet Wt of Material						
% Moisture						
Dry Wt of Material						
Percent By Weight						100 %
Test No. 2 Sampling Time Period:						
Wet Wt of Material						
% Moisture						
Dry Wt of Material						
Percent By Weight						100 %
Test No. 3 Sampling Time Period:						
Wet Wt of Material						
% Moisture						
Dry Wt of Material						
Percent By Weight						100 %
Test No. 4 Sampling Time Period:						
Wet Wt of Material						
% Moisture						
Dry Wt of Material						
Percent By Weight						

-- OVER --

Composite Material Moisture Content (TR 403)						
Test No.	1	2	3	4	5	6
Wet Wt Sample						
Dry Wt Sample						
Wt Water						
% Moisture						
Opt. Moisture						

Pulverization (TR 431)					
Test No.		1	2	3	4
Adjusted Wet Wt. Sample (A)					
Wt of + 19 mm (3/4") Material (B_1)					
Wt of + 4.75 mm (No. 4) Material (B_2)					
% Pulverization 19 mm (3/4") (P_1)	$100 \times \frac{(A - B_1)}{A}$				
% Pulverization 4.75 mm (No. 4) (P_2)	$100 \times \frac{A - (B_1 + B_2)}{A}$				

DOTD Acceptance for % Payment - Cement				
Test No.	Represents			% Payment Cement
___	Load No. ___	Thru	Load No. ___	___
___	Load No. ___	Thru	Load No. ___	___
___	Load No. ___	Thru	Load No. ___	___
___	Load No. ___	Thru	Load No. ___	___

Certified Soil and Base Course Technican

DOTD Inspector

Project Engineer

PLANT EQUIPMENT – DAILY CENTRAL MIX PLANT REPORT (03-22-0754)

EQUIPMENT INSPECTION AND CERTIFICATIONS

STANDARD PLANS INDEX
EVIRONMENTAL DOCUMENTATION

Location Online

http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Standard_Plans/Pages/default.aspx

Link to Erosion Control Standard Plans EC-01 - sheets 1 and 2

http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Standard_Plans/Pages/default.aspx?RootFolder=%2FInside%5FLaDOTD%2FDivisions%2FEngineering%2FStandard%5FPlans%2FStandard%20Plans%2FErosion%20Control%20and%20Bedding%20Material&FolderCTID=0x012000759B9DC184A87A4E8BAEACED94697A67&View={6CA8D877-4BA0-45CA-83B0-350384A89137}

STORMWATER POLLUTION PREVENTION PLAN CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____

Chief Engineer, Louisiana Department of Transportation and Development

Date: _____

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the general National Pollution Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with construction activity from the site identified as part of this certificate.

Name of Contractor: _____

Contractor Representative

Print Name: _____

Signature: _____

Address of Contractor: _____

_____

Telephone No.: _____

Date: _____

To: **Prospective Applicants for a Stormwater General Permit Associated with Construction Activity Greater than 5 Acres**

Attached is a **Stormwater General Permit Associated with Construction Activity Greater than 5 Acres Notice of Intent (NOI) CSW-G,** for a Louisiana Pollutant Discharge Elimination System (LPDES) permit, authorized under EPA's delegated NPDES program under the Clean Water Act. To be considered complete, every item on the form must be addressed and the last page signed by an authorized company agent. If an item does not apply, please enter "NA" (for not applicable) to show that the question was considered.

Two copies (one original and one copy) of your **completed NOI** should be submitted to:

Mailing Address:
Department of Environmental Quality
Office of Environmental Services
Post Office Box 4313
Baton Rouge, LA 70821-4313
Attention: Water Permits Division

Physical Address (if NOI is hand delivered):
Department of Environmental Quality
Office of Environmental Services
602 N Fifth Street
Baton Rouge, LA 70802
Attention: Water Permits Division

Please be advised that completion of this NOI may not fulfill all state, federal, or local requirements for facilities of this size and type.

According to L. R. S. 48:385, any discharge to a state highway ditch, cross ditch, or right-of-way shall require approval from:

Louisiana DOTD
Office of Highways
Post Office Box 94245
Baton Rouge, LA 70804-9245
(225) 379-1927

AND

Louisiana DHH
Office of Public Health
Center for Environmental Services
Post Office Box 4489
Baton Rouge, LA 70821-4489
(225) 342-7395

A copy of the LPDES regulations may be obtained from the Department's website at http://www.deq.louisiana.gov/portal/tabid/1674/Default.aspx.

After the review of the NOI, this Office will issue written notification to those applicants who are accepted for coverage under this general permit.

For questions regarding this NOI please contact the Water Permits Division at (225) 219-9371. For help regarding completion of this NOI please contact DEQ, Small Business/Small Community Assistance at 1-800-259-2890.

form_7006_r08
2/23/2012

Page 1 of 16
CSW-G

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
Office of Environmental Services, Permits Division
Post Office Box 4313
Baton Rouge, LA 70821-4313
PHONE#: (225) 219-9371

LPDES NOTICE OF INTENT (NOI) TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY GREATER THAN 5 ACRES
(Attach additional pages if needed.)

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by an LPDES permit issued for stormwater discharges associated with construction activity in Louisiana. In order to be automatically authorized under General Permit LAR100000 you must submit a complete and accurate NOI to LDEQ.

EVERY ITEM MUST BE COMPLETED.

Submission of this Notice of Intent also constitutes that implementation of the Storm Water Pollution Prevention Plan required under the general permit will begin at the time the permittee commences work on the construction project identified in Section II below.

SECTION I - FACILITY INFORMATION

A. **Permit is to be issued to the following:** (must be a party having operational control over construction plans and specifications and /or a party having day-to-day operational control over those activities at a project site which are necessary to ensure compliance with the storm water pollution prevention plan or other permit conditions LAC 33:IX.2501.B and LAC 33:IX.2503.A and B).

1. Legal Name of Applicant
(Company, Partnership, Corporation, etc.) _____

Project Name _____

(NOTE: Only one NOI needs to be submitted to cover all of the permittee's activities on the common plan of development or sale (e.g., you do not need to submit a separate NOI for each separate lot in a **residential subdivision** or for two separate buildings being constructed on the same property, provided your SWPPP covers each area for which you are the operator.)

Mailing Address _____

_____ Email: _____ Zip Code: _____

If the applicant named above is not also the owner, state owner name, phone # and address.

_____

_____

Check status: ☐ Federal ☐ Parish ☐ Municipal ☐
☐ State ☐ Public ☐ Private ☐ Other: _____

2. Location of project. Provide a specific address, street, road, highway, interstate, and/or River Mile/Bank location of the project for which the NOI is being submitted.

_____

City _____ Zip Code _____ Parish _____

form_7006_r08
2/23/2012

Page 2 of 16
CSW-G

NOTICE OF INTENT

ENVIRONMENTAL DOCUMENTATION

SECTION I - FACILITY INFORMATION

Front Gate Coordinates:

Latitude- _____deg. ____min. _____sec. Longitude- _____deg. _____ min. ____sec.

Method of Coordinate Determination: _____

(ex:http://terraserver-usa.com/Quad Map, Previous Permit, website, GPS)

Is the facility located on Indian Lands? ☐ Yes ☐ No

B. Stormwater Pollution Prevention Plan Information.

1. Has the Stormwater Pollution Prevention Plan (SWPPP) been prepared? (NOTE: The SWPPP must be prepared prior to submittal of the NOI. Do **not** submit SWPPP with this NOI.)

   ☐ Yes ☐ No

2. Indicate address of location of SWPPP if different from Project Location. **(N/A if SWPPP is located at the construction site.)**

   Address _____

   City _____ State _____ Zip _____

C. Location Information

1. Estimated Construction Start Date: (mo/day/yr) _____
2. Estimated Construction Completion Date: (mo/day/yr) _____
3. Estimate of area to be disturbed (to nearest acre) _____
4. Describe the project or facility being constructed, such as a subdivision, single home, business, road project, or retail development **(be specific, if clearing land indicate if there are future plans to build a facility, subdivision, or retail development)**:

   _____

   _____

5. Is the project part of a larger development or subdivision? (5 acres or greater) ☐ Yes ☐ No

   If yes, provide the name of the development or subdivision. _____

D. Discharge Information

1. Indicate how the storm water run-off reaches state waters (named water bodies). This will usually be either *directly*, by *open ditch* (if it is a highway ditch, indicate the highway), or by *pipe*. Please specifically name all of the minor water bodies that your discharge will travel through on the way to a major water body. This information can be obtained from U.S.G.S. Quadrangle Maps. Maps can also be obtained online at http://map.deq.state.la.us/ or www.topozone.com. Private map companies can also supply you with these maps. If you cannot locate a map through these sources you can contact the Louisiana Department of Transportation and Development at the address on the first page of this form.

   By _____(effluent pipe, ditch, etc.);

   thence into _____(effluent pipe, ditch, etc.);

   thence into _____(Parish drainage ditch, canal, etc.);

   thence into (named bayou, creek, stream, etc.)

NOTICE OF INTENT

ENVIRONMENTAL DOCUMENTATION

2. Based on Appendix C, the Outstanding Natural Resource Water (ONRW) list, does your stormwater run-off flow directly into a waterbody listed as an ONRW?

☐ Yes ☐ No

NOTE: If the discharge will ultimately enter a scenic stream, contact the Louisiana Department of Wildlife and Fisheries (LDWF) Scenic Stream Division at 318-343-4044 for direction regarding how to comply with their requirements.

3. Based on Appendix A, Endangered Species Guidance, are there any listed endangered or threatened species in the project area?

☐ Yes ☐ No

NOTE: Use the Endangered Species Guidance in Appendix A to determine if there are listed endangered or threatened species in the project area. Applicants should contact the U. S. Fish and Wildlife Service (address is in Appendix A) for guidance if they need assistance in making a determination.

4. Based on Appendix B, Historic Properties Guidance, are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility or in proximity to the discharge?

☐ Yes ☐ No

5. Was the State Historic Preservation Office (see Part I.A.3.f of the permit) involved in your determination of eligibility?

☐ Yes ☐ No

E. Additional Discharge Information

1. Will the project or facility expansion, post-construction, result in a discharge that will require a wastewater discharge permit such as treated sanitary wastewater from a subdivision or apartment complex, industrial storm water or process wastewater?

☐ Yes ☐ No (e.g. direct to city POTW or no post-construction discharge)

2. If yes, does the subdivision, complex, or facility have an LPDES water discharge permit?

☐ Yes ☐ No

If yes, what is the LPDES permit number? _____

3. If the facility has an LPDES water discharge permit, will the construction activity result in an increase to the permitted discharge?

☐ No ☐ Yes – Please Explain: _____

4. If the facility **does not** have an LPDES permit or if the construction will result in an **increased discharge,** the party or developer responsible for construction plans and specifications must provide a Request for Preliminary Determination (RPD), Notice of Intent (NOI), or a request for permit modification within **14 days** of submittal of the Construction NOI to: DEQ, OES, P.O. Box 4313, Baton Rouge, LA 70821-4313, Attn: Water Permits Division. Failure to submit this information may result in denial of this and/or any future applications for discharge of wastewater to waters of the state. The "Request for Preliminary Determination of LPDES Permit Issuance Form" requests the information referenced above and can be accessed on our web page http://www.deq.louisiana.gov under DIVISIONS, Water Permits, LPDES Permits, LPDES forms.

NOTICE OF INTENT

ENVIRONMENTAL DOCUMENTATION

SECTION II – LAC 33.I.1701 REQUIREMENTS

Does the company or owner have federal or state environmental permits in other states that are identical to, or of a similar nature to, the permit for which you are applying? (This requirement applies to all individuals, partnerships, corporations, or other entities who own a controlling interest of 50% or more in your company, or who participate in the environmental management of the facility for an entity applying for the permit or an ownership interest in the permit.)

☐ Permits in Louisiana. List Permit Numbers: _____

☐ Permits in other states (list states): _____

☐ No environmental permits.

Do you owe any outstanding fees or final penalties to the Department? ☐ Yes ☐ No

If yes, please explain.

Is your company a corporation or limited liability company? ☐ Yes ☐ No

If yes, is the corporation or LLC registered with the Secretary of State? ☐ Yes ☐ No

SECTION III - SIGNATURE

According to the Louisiana Water Quality Regulations, LAC 33:IX.2503, the following requirements shall apply to the signatory page in this application:

Chapter 25. Permit Application and Special LPDES Program Requirements

2503. Signatories to permit applications and reports

A. All permit applications shall be signed as follows:

1. For a corporation - by a responsible corporate officer. For the purpose of this Section responsible corporate officer means:

   (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or

   (b) The manager of one or more manufacturing, production, or operating facilities provided: the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations and initiating and directing other comprehensive measures to ensure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken together complete and accurate information for permit application requirements; and the authority to sign documents has been assigned or delegated to the manager in accordance with corporation procedures.

NOTE: LDEQ does not require specific assignments or delegations of authority to responsible corporate officers identified in the Permit **Standard Permit Conditions, Part VI.G.1.a(1)** The agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the state administrative authority to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under Permit **Standard Permit Conditions, Part VI.G.1a.(2)** rather than to specific individuals.

2. For a partnership or sole proprietorship - by a general partner or the proprietor, respectively; or

3. For a municipality, state, federal or other public agency – by either a principal executive officer or ranking elected official. For the purposes of this section a principal executive officer of a federal agency includes:

   (a) The chief executive officer of the agency, or

   (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I also certify that a storm water pollution prevention plan, including both construction and post construction controls, has been prepared for the site in accordance with the permit and that such plan complies with approved State, Tribal and/or local sediment and erosion plans or permits and/or storm water management plans or permits. I am aware that signature and submittal of the NOI is deemed to constitute my determination of eligibility under one or more of the requirements of Permit Part I.A.3.e(1), related to the Endangered Species Act requirements. To the best of my knowledge, I further certify that such discharges and discharge related activities will not have an effect on properties listed or eligible for listing on the National Register of Historic Places under the National Historic Preservation Act, or are otherwise eligible for coverage under Part I.A.3.f of the permit. I am also aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NOTE: SIGNATURE MUST COMPLY WITH REQUIREMENTS STATED ABOVE IN SECTION III.

Signature _____

Printed Name _____

Title _____

Company _____

Date _____

Telephone _____

*****ANY NOI THAT DOES NOT CONTAIN ALL OF THE REQUESTED INFORMATION WILL B CONSIDERED INCOMPLETE. NOI PROCESSING CANNOT PROCEED UNTIL ALL REQUIRE INFORMATION HAS BEEN SUBMITTED**.

NOTICE OF INTENT

ENVIRONMENTAL DOCUMENTATION

NOTICE OF TERMINATION
ENVIRONMENTAL DOCUMENTATION

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
Office of Environmental Services, Water Permits Division
Post Office Box 4313
Baton Rouge, La 70821-4313
Phone#: (225) 219-9371

LPDES NOTICE OF TERMINATION (NOT) OF COVERAGE UNDER LPDES GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY GREATER THAN 5 ACRES

SECTION I –PERMIT INFORMATION

Facility's Storm Water General Permit Authorization Number LAR10 ___ ___ ___ ___

Check here if you are no longer the Operator of the Facility OR if the facility has been sold ☐ Date: _____

Check here if the Storm water discharge associated with the construction activity is Being Terminated ☐ Date: _____

SECTION II – FACILITY OPERATOR INFORMATION

Name _____

Address _____

City _____

State _____ Zip _____ Phone _____

SECTION III – FACILITY/SITE LOCATION INFORMATION

Name of Project _____

Location of Project _____

City _____ State _____ Zip _____

Parish _____

SECTION IV – CERTIFICATION

I certify under penalty of law that all storm water discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or that I am no longer an operator at the construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under this general permit, and that discharging pollutants in storm water associated with construction activity to waters of the State is unlawful under the Clean Water Act where the discharge is not authorized by a LPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violation of this permit or the Clean Water Act.

Print Name _____ Date _____

Signature _____

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7/5/11

Page 1 of 1
CSW-T

ATTACHMENT 7

Recommendations: **District Laboratory Engineer**

Considerations:
If reconstruction of the base is recommended, have you conducted sufficient tests to ensure the recommended base will be satisfactory?
Are in-place materials suitable for treatment/stabilization? Is excessive material a problem? Will borrow be needed?, etc….

State your recommendations for the rehabilitation of this roadway in full. Use as many additional sheets as necessary. Attach subgrade soil survey with this submittal.

_____

District Laboratory Engineer Date