STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

CONSTRUCTION PROPOSAL

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
DRY PRONG – WINN PARISH LINE
ROUTE US 167
GRANT AND WINN PARISHES

FOR INFORMATION ONLY

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NOTICE TO CONTRACTORS (08/06)

Sealed bids for the following project will be received by the Louisiana Department of Transportation and Development (DOTD), 1201 Capitol Access Road, Headquarters Administration Building, Room 405-L, Baton Rouge, Louisiana 70802 until 8:00 a.m. on **Wednesday, June 27, 2007**. After 8:00 a.m., bids will be received in the Headquarters Auditorium until 10:00 a.m., at which time and place bids will be publicly opened and read. No bids will be received after 10:00 a.m. Any person requiring special accommodations shall notify the Department of Transportation and Development (DOTD) at (225) 379-1111 not less than 3 business days before bid opening.

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
DESCRIPTION: **DRY PRONG – WINN PARISH LINE**
ROUTE: **US 167**
PARISHES: **GRANT AND WINN**
LENGTH: **14.437 miles.**
TYPE: **GRADING, DRAINAGE STRUCTURES, LIME TREATMENT, CLASS II BASE COURSE, SUPERPAVE ASPHALTIC CONCRETE PAVEMENT, CONCRETE SLAB SPAN BRIDGES, TRAFFIC SIGNALIZATION AND RELATED WORK.**
LIMITS: State Project No.023-03-0013: **DRY PRONG (JCT. LA 123) TO WINN PARISH LINE.**
LIMITS: State Project No. 023-04-0030: **GRANT PARISH/WINN PARISH LINE TO ONE-HALF MILE NORTH OF THE WINN PARISH LINE.**
ESTIMATED COST RANGE: **$30,000,000 TO $50,000,000**
PROJECT ENGINEER: **JOHNSON, THEODORE, LA TIMED MANAGERS, WINNFIELD AREA OFFICE, 517 THOMAS MILL ROAD, WINNFIELD, LA 71483, (225) 906-3203.**
DOTD COORDINATOR: **DEAN, WILLIAM, 10403 LA 8, COLFAX, LA 71417, (318) 627-5922.**
PROJECT MANAGER: **GUNTER, STEVE, (225) 906-1300.**
COST OF PROPOSAL FORMS: **$25.00**
COST OF PLANS: **$94.50**

Bids must be submitted in accordance with Section 102 of the 2006 Louisiana Standard Specifications for Roads and Bridges as amended by the project specifications, and must include all information required by the proposal.

Plans and/or proposals may be obtained in Room 101-A of the DOTD Headquarters Administration Building, 1201 Capitol Access Road in Baton Rouge, or by contacting the DOTD; Email: sknight@dotd.la.gov, Phone (225) 379-1111, FAX: (225) 379-1714, or by written requests sent to the Louisiana Department of Transportation and Development, Contracts Management Section, P. O. Box 94245, Baton Rouge, LA 70804-9245. Proposals will not be issued later than 24 hours prior to the time set for opening bids. Purchase price for plans and proposals is non-refundable. Plans and specifications may be seen at the Project Engineer's office or in Room 101-A of the DOTD's Headquarters Administration Building in Baton Rouge. Upon request, the Project Engineer will show the work.

The U. S. Department of Transportation (DOT) operates a toll free "Hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should call 1-800-424-9071. All information will be treated confidentially and caller anonymity will be respected.

SPECIAL PROVISIONS

GENERAL BIDDING REQUIREMENTS (08/06): The specifications, contract and bonds governing the construction of the work are the 2006 Edition of the Louisiana Standard Specifications for Roads and Bridges, together with any supplementary specifications and special provisions attached to this proposal.

Bids shall be prepared and submitted in accordance with Section 102 of the Standard Specifications.

The plans herein referred to are the plans approved and marked with the project number, route and Parish, together with all standard or special designs that may be included in such plans. The bidder declares that the only parties interested in this proposal as principals are those named herein; that this proposal is made without collusion or combination of any kind with any other person, firm, association, or corporation, or any member or officer thereof; that careful examination has been made of the site of the proposed work, the plans, Standard Specifications, supplementary specifications and special provisions above mentioned, and the form of contract and payment, performance, and retainage bond; that the bidder agrees, if this proposal is accepted, to provide all necessary machinery, tools, apparatus and other means of construction and will do all work and furnish all material specified in the contract, in the manner and time therein prescribed and in accordance with the requirements therein set forth; and agrees to accept as full compensation therefore, the amount of the summation of the products of the quantities of work and material incorporated in the completed project, as determined by the engineer, multiplied by the respective unit prices herein bid.

It is understood by the bidder that the quantities given in this proposal are a fair approximation of the amount of work to be done and that the sum of the products of the approximate quantities multiplied by the respective unit prices bid shall constitute gross sum bid, which sum shall be used in comparison of bids and awarding of the contract.

The bidder further agrees to perform all extra and force account work that may be required on the basis provided in the specifications.

The bidder further agrees that within 15 calendar days after the contract has been transmitted to him, he will execute the contract and furnish the Department satisfactory surety bonds.

If this proposal is accepted and the bidder fails to execute the contract and furnish bonds as above provided, the proposal guaranty shall become the property of the Department; otherwise, said proposal guaranty will be returned to the bidder; all in accordance with Subsection 103.04.

TRANSPORTATION INFRASTRUCTURE MODEL FOR ECONOMIC DEVELOPMENT (TIMED) PROJECT (06/05): This project is a Transportation Infrastructure Model for Economic Development (TIMED) project as defined in Act No. 16 of the 1989 First Extraordinary Session of the Legislature which enacted Part V of Chapter 7 of Subtitle II of Title 47 of Louisiana Revised Statutes of 1950, comprised of R.S. 47:820.1 through 820.6.

The contractor understands and agrees that compliance with Louisiana R.S.47:820.3 is mandatory as stated below:

820.3 EMPLOYMENT OF LOUISIANA RESIDENTS

At least eighty percent of the employees employed on any Transportation Infrastructure Model for Economic Development (TIMED) project must be Louisiana residents. A "Louisiana resident" shall be defined for the purposes of this Part as a person who has resided in this state for at least one hundred eighty consecutive days at the time of initial employment, as evidenced by a valid Louisiana motor vehicle operator's license or bill for utility services.

The contractor shall maintain sufficient records to ensure compliance herewith and shall submit by the end of the first estimate period, copies of valid Louisiana Motor Vehicle Operator's License or bill for utility services for all project personnel. Proof of residency must be submitted for each new employee hired or assigned to the project until completion. The contractor shall submit proof of residency to the project engineer. The project engineer will forward proof to the Compliance Programs Section at P.O. Box 94245, Baton Rouge, LA 70804-9245.

SPECIAL NOTICES TO CONTRACTOR:

ASBESTOS INVESTIGATION REPORT: The Contractor may obtain a report entitled "Asbestos Site Investigation Report, 023-03-0013 (Dry Prong – Winn Parish Line), Grant and Winn Parishes, Louisiana" from Louisiana Timed Managers, 6300 Corporate Boulevard, Suite 200, Baton Rouge, LA 70809-1000, phone (225) 906-1300; fax (225) 906-1400. The report may also be reviewed online at ftp://66.135.25.121/asbestos_reports. The name of the report is 023-03-0013, Dry Prong – Winn Parish Line Asbestos Inspection Report.pdf. This report is for informational purposes only.

NATIONAL FOREST STIPULATIONS AND REQUIREMENTS: "U.S. National Forest Construction Stipulations and Requirements" are included elsewhere herein, and for instances where these stipulations and requirements are in conflict with Special Provisions and/or Supplemental Specifications, the more stringent requirements shall apply, as approved by the Project Engineer and the US Forest Service, U.S. Department of Agriculture.

COST-PLUS-TIME BIDDING PROCEDURE (A + B METHOD): The 2006 Standard Specifications and Supplemental Specifications, as amended elsewhere herein, are further amended as follows:

General. The process for bidding and the award of this project will take into account not only the contract amount bid but also the bidder's stated contract time in which the project will be completed to final acceptance. This method will only be used to determine the successful bidder. It will not be used to determine the award amount nor final payment to the contractor.

Definition of Terms. For this project the following definitions apply:

(a) Calendar Day – Refer to Subsection 101.03.
(b) Contract Amount – The summation of the products of the quantities shown in the Schedule of Items multiplied by the unit bid prices.
(c) Contract Time – The number of calendar days stated in the successful bidders proposal to complete the project to final acceptance as adjusted by authorized extensions.
(d) Daily Road User Cost – The amount which represents the average daily cost of interference and inconvenience to the road user. The Department has assigned a daily road user cost of $4200 per calendar day for this project.
(e) Final Acceptance – Refer to Subsection 105.17(b).

Preparation of Proposal. In addition to all other bidding requirements of the project specifications, the bidder shall state his required completion time in the space provided on the "CONTRACT TIME" form contained elsewhere herein. The proposed completion time shall be based on the construction phases shown in the plans in their respective order and will be a factor used in considering bids for award. The stated number of calendar days required for completion will be the contract time for this project should the bidder be successful. The total number of days stated by the bidder to complete the project shall not exceed the maximum allowable

contract time stated on the "CONTRACT TIME" form contained elsewhere herein. Bids not including a contract time, or showing time to completion in excess of the maximum amount will be considered irregular and will be rejected.

Consideration of Bids. After bids are opened and read, they will be compared based on the Total Bid Amount as determined by the following formula. In case of equal total bid amounts between qualified bidders, award will be made to the bidder proposing the lowest contract time.

Total Bid Amount = A + B
Where:
A = the contract amount as defined herein.
B = the product of the number of calendar days of contract time stated by the bidder and the daily road user cost contained herein.

Late Completion. Should the contractor fail to complete the project to final acceptance price to expiration of the contract time, stipulated damages will be charged in accordance with the special provision entitled **"FAILURE TO COMPLETE ON TIME"** contained elsewhere herein.

INTENT OF CONTRACT (11/95): Subsection 104.01, Intent of Contract, is amended to include the following.

(a) Covenant of Good Faith and Fair Dealing.

This contract imposes an obligation of good faith and fair dealing in its performance and enforcement.

The contractor and the Department agree from the beginning to focus on creative cooperation, to avoid adverse confrontation, and to foster mutual respect, along with a positive commitment to honesty and integrity, and agree to the following mutual duties.

(1) Each will function within the laws and statutes applicable to their duties and responsibilities.
(2) Each will communicate in an open and candid manner.
(3) Each will assist in the other's performance.
(4) Each will avoid hindering the other's performance.
(5) Each will proceed to fulfill its obligations diligently.
(6) Each will cooperate in the common endeavor of the contract.

(b) Voluntary Partnering.

The Louisiana Department of Transportation and Development intends to encourage the foundation of a cohesive partnership with the contractor and its principal subcontractors and suppliers. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objective is a cooperative approach to contract management that will reduce costs, litigation, and "stress" while completing the project in accordance with the plans and specifications.

This partnership will be bilateral in makeup, and participation in partnering will be totally voluntary and is not a requirement of the contract.

A partnering conference is to be implemented and held prior to beginning construction. The contractor's management personnel and the Project Engineer will initiate a partnering development conference. They, working with the assistance of the District Construction Engineer, will make arrangements to determine the facilitator, the attendees at the conference, agenda of the conference, duration, and location. Persons required to be in attendance will be the Project Engineer and key project personnel; the contractor's on-site project manager and key project supervision personnel of both the prime and principal subcontractors and suppliers. The project design engineers, FHWA, key company representatives, and key local government

personnel will also be invited to attend as necessary. The contractor and DOTD will also be required to have Regional/District and Corporate/State level managers on the project team.

Any cost associated with effectuating this partnering will be agreed to by both parties and will be shared equally and will be paid for in accordance with Subsection 109.04. The contractor, DOTD, FHWA and all others invited to the partnering conference will be responsible for any expenses incurred by their respective employees which includes salaries, travel, and lodging.

Follow-up conferences may be held periodically throughout the duration of the contract as agreed by the contractor and the DOTD.

The establishment of a partnership charter on a project will not change the legal relationship of the parties to the contract nor relieve either party from any of the terms of the contract. This partnership charter is intended only to establish an environment of cooperation and communication between all parties involved with the completion of the project.

MAINTENANCE OF TRAFFIC (08/06): Subsection 104.03 of the 2006 Standard Specifications is amended to include the following requirements.

The contractor shall provide for and maintain through and local traffic at all times and shall conduct his operations in such manner as to cause the least possible interference with traffic at junctions with roads, streets and driveways.

In order to maintain traffic, the contractor shall construct temporary detours as required by the contract.

All asphaltic concrete pavement new construction, overlays, and shoulder surfacing operations open to traffic shall be conducted in accordance with the following requirements.

1. Shoulder Subgrade Preparation: Any required embankment widening shall be completed before placement of the asphaltic concrete overlay. All vegetation shall be removed from existing shoulders before beginning temporary or final shoulder construction.

2. Temporary Shoulder Construction: Temporary shoulder construction described herein shall be completed at the end of each day's operations for all asphaltic concrete courses except the final wearing course. There shall be no drop-off from the pavement edge to the shoulder. The contractor shall blade and shape existing shoulder material against, and approximately level with, the top of the pavement surfacing to form a temporary shoulder with a uniform slope from the pavement edge to the existing shoulder line, or to a point 10 feet (3 m) from the pavement edge. If existing shoulder materials are insufficient, the contractor shall furnish, place and shape additional shoulder surfacing materials to form the temporary shoulder. Existing and/or additional materials for temporary shoulders shall be to the satisfaction of the engineer. Compaction shall be by approved methods.

No direct payment will be made for constructing and subsequently reshaping temporary shoulders, except payment for additional materials under appropriate pay items.

CONTRACTOR QUALITY CONTROL: Subsection 106.05 of the 2006 Standard Specifications is amended as follows:

The second paragraph is deleted and the following substituted.

Quality Control requirements shall be as specified in the appropriate specification section and as specified in the latest edition of the Department's "Quality Control/Quality Assurance Manual". In case of a discrepancy, the project specification shall govern over the manual.

The contractor shall perform sufficient testing to assure that his processes are providing work in accordance with the plans and specifications. The minimum frequency of quality control testing shall be equal to or greater than the minimum frequencies shown for acceptance in the DOTD Materials Sampling Manual. The results of the contractor's tests shall be furnished

to the engineer on a routine basis, usually daily, and upon completion of an item of work, a summary of the quality control tests shall be provided to the engineer.

PUBLIC CONVENIENCE AND SAFETY (09/05): Subsection 107.07 of the Standard Specifications is amended to include the following.

The procurement of police officers for public safety during construction shall be in accordance with the Department's Policy for Use of Police Officers in Construction/Maintenance Work Zones. The DOTD project engineer shall determine the need for police officers to assist in controlling traffic in a particular work zone. The number of officers needed, the tasks they will perform, and their location within the work zone will vary as a function of the zone type. Police officers shall be placed at strategic locations at times during construction as determined by the DOTD project engineer.

The three types of law enforcement services are Police Presence, Police Enforcement and Police Traffic Control. Police Presence is defined as the use of police officers at the beginning of the active work zone area utilizing their blue lights to gain the attention of drivers. Police Enforcement is utilized when enforcement is required to enhance the safe operation of the work zone. Police Traffic Control is to be used in detour / diversion situations.

The DOTD project engineer will extend an invitation to the appropriate Louisiana State Police (LSP) Troop Commander to attend the pre-construction conference.

Prior to commencing the work on the project, the contractor shall contact the LSP Troop Commander to obtain law enforcement services of police officers during construction. If the LSP Troop is unable to provide law enforcement services for the project work zone, the LSP Troop Commander or the contractor will extend the invitation to the appropriate local law enforcement authorities.

Police officers will report directly to the contractor. However, the contractor will not have the authority to direct the placement of the police officer or the patrol vehicle in situations that are contrary to established procedures and/or could endanger the police officer. The DOTD project engineer will make the final determination on all issues regarding police officer responsibility in work zones.

Prior to the beginning of the shift, the contractor shall provide a daily work zone briefing to the police officer. For major changes in traffic patterns, advanced notification shall be provided to the police agency working the detail. This information should also be provided to the motoring public through the DOTD district and / or the LSP Troop.

The contractor shall pay for law enforcement services provided by the police officers based on the hourly wage and vehicle rate fee schedule below. The Department will reimburse the contractor monthly for the incurred cost. The contractor shall furnish time record documentation with the request for reimbursement. The provisions of Subsection 109.04 shall not apply to this reimbursement.

The agreed upon fee schedule for police officers in the work zone is as follows:

$25 per vehicle per day - vehicle use fee

$40 per hour per officer (one officer per vehicle) (minimum 2 hours).

NAVIGABLE WATERS AND WETLANDS (07/05): Subsection 107.09 of the Standard Specifications is amended to include the following.

In accordance with the provisions of this Subsection, the Department has obtained the required U.S. Army Corps of Engineers permit.

Bidders shall comply with the permit requirements. Bidders may obtain a copy of these permits by contacting the Department's Environmental Section at (225) 379-1317.

FOREST PROTECTION: Subsection 107.13 of the 2006 Standard Specifications is amended to include the "U.S. Forest Service Construction Stipulations and Requirements" included elsewhere herein.

The U.S. Forest Service Construction Stipulations will apply on all U.S. Forest Service property on this project. The U.S. Forest Service property begins at the beginning of the project and ends at the end of the project.

ENVIRONMENTAL PROTECTION (08/06): Subsection 107.14 of the 2006 Standard Specifications is amended to include the following paragraphs at the end of this subsection.

The Notice of Intent (NOI) will be submitted by the Department to the Louisiana Department of Environmental Quality (LADEQ) prior to the project letting. The project engineer will complete and submit the Notice of Termination (NOT) to the LADEQ after final stabilization of the site, in accordance with the terms of the permit.

The use of erosion control features or methods other than those in the contract shall be as directed.

The Storm Water Pollution Prevention Plan shall be comprised of Section 204 of the standard specifications along with applicable supplemental specifications and special provisions, and Standard Plan EC-01, "Temporary Erosion Control Details."

DAMAGE CLAIMS: Subsection 107.17 of the 2006 Standard Specifications is amended as follows:

Subsection 107.17, Damage Claims, is deleted and the following substituted.

The contractor shall indemnify the Department, its officers and employees and its program management consultant (LTM), from all suits, actions, or claims brought because of injuries or damage sustained by any person or property due to operations of the contractor; due to negligence in safeguarding the work; or use of unacceptable materials in constructing the work; or any negligent act, omission, or misconduct of the contractor; or claims or amounts recovered from infringements of patent, trademark, or copyright; or from claims or amounts arising or recovered under the Workmen's Compensation Act or other law, ordinance, order, or decree; any money due the contractor as considered necessary by the Department for such purpose may be retained for use of the State; or in case no money is due, the surety bond may be held until such suits, actions, claims for injuries or damages have been settled and suitable evidence to that effect furnished to the Department; except that money due to the contractor will not be withheld when the contractor produces satisfactory evidence that adequate Workmen's Compensation, Public Liability, and Property Damage Insurance are in effect.

SUBLETTING OF CONTRACT (1/83): In accordance with Subsection 108.01 of the Standard Specifications, the following items are designated as "Specialty Items":

Item 202-02-02, Removal of 1962 Sq. Ft. Brick Residence (Lt. of Sta. 222+27.21)(Contains Non-Friable Asbestos)

Item 202-02-03, Removal of 223 Sq. Ft. Brick Storage Building (Lt. of Sta. 222+47.21)(Contains Non-Friable Asbestos)

Item 202-02-17, Removal of 2595 Sq Ft. Brick Residence (Lt. of Sta. 288+39.39)(Contains Friable Asbestos)

Item 202-02-20, Removal of 960.5 Sq. Ft. Wood Residence (Lt. of Sta. 296+13.14)(Contains Non-Friable Asbestos)

Item 202-02-24, Removal of 50.1' x 28.2' Wood Residence (Lt. of Sta. 731+24.05)(Contains Non-Friable Asbestos)

Item 202-02-29, Removal of 1,025 Sq. Ft. Wood Building (Lt. of Sta. 16+00.00-Left Turn Military Road)(Contains Non-Friable Asbestos)

Item 704-03, Blocked Out Guard Rail
Item 704-06, Guard Rail Anchor Sections (Trailing Ends)
Item 704-08-B, Guard Rail Transitions (Double Thrie Beam)
Item 704-11-A, Guard Rail End Treatment (Flared)
Item 705-08, Rebuilt Fence
Item 729-16-C, Object Marker Assembly (Type 3)
Item 729-19-A, Dead End Road Installation (Type A)
Item 731-02, Reflectorized Raised Pavement Markers
Item 732-02-A, Plastic Pavement Striping (Solid Line)(4" Width)
Item 732-02-C, Plastic Pavement Striping (Solid Line)(8" Width)
Item 732-02-E, Plastic Pavement Striping (Solid Line)(24" Width)
Item 732-03-A, Plastic Pavement Striping (Broken Line)((4" Width)
Item 732-04-A, Plastic Pavement Legends and Symbols (Arrow)
Item 732-04-C, Plastic Pavement Legends and Symbols (Only)
Item 732-04-D, Plastic Pavement Legends and Symbols (RR Crossing)
Item 732-05-A, Removal of Existing Markings (Water Blasting)
Item 736-01, Trenching and Backfilling
Item 736-04-A, Signal Support (35' Metal Strain Pole)
Item 736-05-01, Signal Heads (1 Section R 12" LED)
Item 736-05-02, Signal Heads (1 Section Y 12"LED)
Item 736-06, Signal Service
Item 736-08, Signal Controller
Item 736-10-A, Underground Junction Box (Type E)
Item 736-10-B, Underground Junction Box (Type H)
Item 736-11-A, Conduit (2" PVC)
Item 736-11-B, Conduit (3" PVC)
Item 736-12-A, Conductor (1C #6 AWG, 600V, Service)
Item 736-12-B, Conductor (6C #14 AWG, 600V)
Item 736-12-C, Conductor (10C #14 AWG, 600V)

INCENTIVE-DISINCENTIVE TO BUILD EXPEDITIOUSLY: Section 108 is hereby amended to include the following requirements.

The contractor will be allowed twenty-five (25) calendar days to complete the clearing and grubbing of the areas marked as "Utility Clearing Corridor" in the plans. The calendar day time for clearing and grubbing the "Utility Clearing Corridor" will begin on the day of the notice to proceed and will end with the completion of the clearing and grubbing within the limits of the "Utility Clearing Corridor". For each day that the clearing and grubbing of the "Utility Clearing Corridor" is completed sooner than the allowed 25 calendar days, the contractor will be paid $1,500.00 per day up to a maximum payment of $22,500.00. For each day of late completion beyond the allowed 25 calendar days, the amount of $1,500.00 per day will be deducted from payments due the contractor up to a maximum of $22,500.00.

For the purposes of measuring completion of time only and so long as no dangerous situation is developed, the brush, stumps, logs, and other debris from the clearing and grubbing of the "Utility Clearing Corridor" operation may be piled on the remaining area of the project for later disposal. For the purposes of measuring completion of time only the "Utility Clearing Corridor" will be cleared, grubbed, and dressed to the conditions that the area is ready for the temporary seeding.

The contractor will be allowed to work multiple shifts, weekends, and holidays as he deems necessary.

CASH MANAGEMENT PLAN - "PHASE FUNDED" CONSTRUCTION (07/04)

This project has been selected by the Department to be implemented under the cash management plan, "phase funding," authorized by LSA-R.S. 48:251 and LAC 70:101 et seq., for certain long-term construction contracts. This construction project will be segmented by fiscal year, and only those funds necessary to carry out planned construction activities in each fiscal year will be appropriated by the Legislature and budgeted by the Department.

The continuation of this contract is contingent upon the continuation of an appropriation of funds by the Legislature to fulfill the requirements of the contract. If the Legislature fails to appropriate sufficient monies to provide for the continuation of this contract or if such appropriation is reduced by the veto of the governor or by any means provided in the Capital Outlay Act, Title 39 of the Louisiana Revised Statutes of 1950, or any other applicable laws to prevent the total appropriations for the year from exceeding revenues for that year or for any other lawful purpose and the effect of such reduction is to provide insufficient monies for the continuation of the contract, the contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated. When a contract, or portion thereof, is terminated for the reasons enumerated herein, the Louisiana Standard Specifications for Roads and Bridges, Subsection 108.11, Termination of Contract, shall govern.

In order to insure adequate funds are budgeted each year for this phase-funded project, the contractor shall comply with the special provision, "Critical Path Method (CPM) For Construction Progress Scheduling", contained elsewhere herein.

Nothing herein shall relieve the contractor from any other requirement or obligation as set forth in the standard specifications, special provisions, supplemental provisions or any other contract requirement.

CRITICAL PATH METHOD (CPM) FOR CONSTRUCTION PROGRESS SCHEDULING (01/06): Critical Path Methods (CPM) as described and with terms as defined in the Associated General Contractors of America (AGC) publication, *Construction Planning and Scheduling*, latest edition, shall be used in construction scheduling, establishing the critical items of work, and measuring progress of the work. In case of discrepancy between these specifications and *Construction Planning and Scheduling*, these specifications shall govern.

Subsection 108.03, Construction Progress Schedule: This subsection is deleted and the following substituted.

The contractor shall submit to the project engineer for approval, CPM Construction Schedules, Summary of Activities tabulations, and Scheduled Earnings tabulations, all as described hereinafter, and altogether defined as "Construction Progress Schedule" or "Construction Schedule". The Construction Progress Schedule shall be based on the planned and specified finished work, the maintenance of traffic restrictions, and other design requirements given in the plans and specifications. Each sheet or page of each submittal shall be identified with the contractor's company name, state project number, project name, date prepared, revision dates, and sheet or page number. If the submittals are not prepared by the contractor's own staff, the company name of the preparer shall be shown on each sheet or page.

The critical activities as shown on the approved Construction Schedule will be considered in establishing the controlling item of work. Scheduled Earnings will be the basis for measurement of contractor's progress.

Approved Construction Progress Schedules and approved associated data shall become part of the contract documents. Un-approved Construction Progress Schedules and associated data shall not be considered relevant or applicable for any purposes during or after completion of the project and shall not be binding on the Department. The sequence of work as represented on the Construction Progress Schedule and subsequent updates shall be interpreted as being the intention of the contractor at the time that the schedule was made.

(a) Construction Schedule: The Construction Schedule shall be a Critical Path Method (CPM) graphic diagram, computer prepared, utilizing the Precedence Diagramming Method (PDM). For the calendar day contract, the Gregorian calendar shall be used.

The schedule shall show and describe the various activities of work required to complete the contract in sufficient detail so that all activities are readily identifiable and progress on the activities can be readily measured. Sufficient detail in bridge work means each element of work (piles, footings, columns, caps, rebar, cure time, etc.) of individual bents; each element of work in individual spans (girders, strip seal joints, Class AA, rebar, cure time, etc.); individual approach slabs; railings; rebar for all of the above as separate activities; and, miscellaneous other bridge work. Sufficient detail in road work means individual runs of pipe in drainage structures; individual box culverts; individual detour roads; the embankment, excavation, base and paving layers within definable geometric limits (e.g., from station to station, within a single ramp, etc.) It shall include submittals and approvals of critical samples, shop drawings, procedures, order lists (pilings for example), or other things that could have a significant schedule impact.

Relatively minor items of work, similar or non-similar, may be grouped together into one activity (or more). Activities to be performed by subcontractors shall be included and identified. The schedule shall show the sequence in which the activities are to be accomplished and their dependency relationships. The estimated contract earnings and pay item quantities associated with each activity shall be included, and the sum of the estimated earnings shall equal the current contract amount.

The duration of activities shall be in whole calendar days and no activity shall have duration of less than one calendar day or more than 30 calendar days. The ending event of the schedule shall be a finish milestone identified as "Contract Completion Date". Its sole predecessor shall be "Reserved Float". The sole predecessor of "Reserved Float" shall be "Final Inspection" which shall be a finish milestone and shall have as predecessors all of the activities that must be completed prior to the Department's final inspection of the work. The duration of "Reserved Float" is the difference between "Final Inspection" and "Contract Completion Date". "Reserved Float" is defined as that part of the shared float reserved exclusively for the contractor's use. The contract date for stipulated damages will be adjusted by change order to the beginning date of the activity "Reserved Float".

The Construction Schedule shall be computer plotted on sheets not larger than 22 inches x 36 inches and shall show a continuous flow of information from left to right with no arrows from right to left and shall be drawn to a time scale of calendar days. The critical path shall be clearly identified. Resource constraints shall be identified, as shall scheduled starts or completions imposed on the schedule by the contractor.

The contractor shall submit color-coded graphics in the required multiple copies. The choice of the color coding must remain in effect for the life of the contract.

The contractor shall provide the Department with the means to electronically translate the Construction Schedule data into a configuration that can be read and processed by the Department or its consultants' hardware and Primavera software. If the contractor elects to use SureTrak Project Manager software, the following defaults must be placed: (1) resources shall be non-driving; (2) default activity type shall be "Task"; (3) activity type shall not be "Independent"; (4) duration display style shall be "Day (d)"; (5) float style shall be "Days"; and, (6) dates time format shall be "Don't show time". The revenue feature in SureTrak Project Manager does not translate to Primavera Project Planner (P3), so in SureTrak Project Manager the earnings must be entered as cost data. In both the SureTrak Project Manager and in the Primavera Project Planner (P3) "Back up" menu selection, the contractor will ensure that the option "Remove access list during backup" is checked. In addition, the project must be saved in SureTrak as a "Concentric P3" Type project.

(b) Summary of Activities: The Summary of Activities shall be a tabulation of all activities shown on the Construction Schedule, and shall accurately reflect the data used in preparation of the Construction Schedule. The summary shall be computer generated and sequenced by activity number. Each activity shall include as a minimum the following, in calendar days:

1. Activity numbers.
2. Activity description.
3. Estimated duration of activity.
4. Early start.
5. Late start.
6. Constrained start, if constrained.
7. Early finish.
8. Late finish.
9. Constrained finish, if constrained.
10. Status (whether critical).
11. Free float.
12. Total float.
13. Monetary value of the activity.
14. Remaining duration and calendar days used.

(c) Scheduled Earnings: The Scheduled Earnings shall be a product of the software creating the Construction Schedule and shall be a tabulation of accumulated scheduled contract earnings, based on late starts, measured in accumulated dollars for all activities, for each monthly partial estimate. The tabulation shall be prepared from the Construction Schedule and shall be computer generated. The Schedule of Earnings will not include advanced payments for stockpiled materials.

(d) Cash Management Document: When designated as a Cash Management Project, prior to the issuance of the Notice to Proceed, the contractor shall provide to the Department and obtain approval from the Department of the Scheduled Earnings report as described above, except that it shall be based on early starts. The Department will use this report for its cash management purposes. Failure of the contractor to provide and obtain approval of the Scheduled Earnings Report will result in withholding of any funds due the contractor.

(e) Submittal: Prior to or at the preconstruction conference the contractor shall submit to the project engineer for approval, in triplicate, a Construction Schedule giving a proposed schedule of operations that provides for completion of the work, a Summary of Activities tabulation, a Scheduled Earnings tabulation, and a Forty-Five Day Look-Ahead task list. The contractor shall also submit the Construction Schedule data electronically capable of being processed with the hardware and software being used by the Department or its consultants.

Within 7 calendar days after receipt of the submittal, the project engineer and contractor shall meet and review the proposed schedules and tabulations. Any revisions resulting from the review shall be submitted, in triplicate, for approval within 7 calendar days after the meeting. This procedure will be repeated as necessary. The approved final schedule shall be called the "Baseline Schedule".

Failure to have obtained approval of a Baseline Schedule and tabulations within 20 calendar days after the Notice to Proceed will result in withholding twenty-five percent of the amount of partial estimates until such schedules and tabulations are submitted and approved.

(f) Construction Schedule Updates: The contractor shall update and submit each month, within 7 calendar days after the partial estimate is submitted, the Construction Schedule critical path diagram, Summary of Activities tabulation, Scheduled Earnings tabulation, a Forty-Five Day Look-Ahead task list, and a current Turnaround Document as follows:

(1) The updated Construction Schedule critical path diagram will be in the same form as that submitted in (e) Submittal. It will be updated for progress through the estimate closing date, recalculated and plotted. The Construction Schedule critical path diagram will show both the look ahead critical path for the duration of the project and the look back critical path as reported in the prior months.

(2) The updated Summary of Activities and Scheduled Earnings tabulation will be in the same form as that submitted in (e) Submittal. It will be updated for progress through the estimate closing date, recalculated and printed.

(3) The Forty-Five Day Look-Ahead task list will show all incomplete activities which the logic has determined either should be or may be active during the next forty-five days. It will be plotted in a graphic form similar to that of the Construction Schedule critical path diagram.

(4) The Turnaround Document will be a listing of the log record of a new activity added monthly to the schedule for the purpose of keeping a current presentation of the following information:

a. The original contract completion date presented as actual calendar date.
b. The number of days added to the contract by approved change order (if any, if none, so state).
c. The present computed completion date presented as an actual calendar date and as a workday number, if applicable.
d. A list of activities deleted and added (if any, if none, so state), including their descriptions.
e. A list of logic changes (if any, if none, so state).
f. A list of budget changes (if any, if none, so state).
g. A narrative description of any other changes to the Construction Schedule critical path diagram.

Failure to submit the monthly updates of the Construction Progress Schedules within 7 calendar days after the partial estimate was submitted will result in withholding of twenty-five percent of the amount of partial estimate payments until such schedules are submitted and approved.

(g) CPM Reviews: The project engineer will designate the time and location for review of construction progress. The contractor's representative designated under Subsection 105.05 will be required to attend the construction progress review or a contractor's representative directed by the project engineer shall attend. The current approved Construction Schedule, Summary of Activities and Scheduled Earnings tabulations shall be reviewed, and required or desired changes discussed and documented.

As a minimum the following shall be discussed: contractor's compliance with approved schedules and tabulations, delays, proposed and approved contract quantity increases and decreases, proposed and approved extra work, actual starts, durations and finishes, and actual contract earnings.

If requested by the project engineer, within 7 calendar days following the review meeting the contractor shall submit to the project engineer for approval, in triplicate, a revised Construction Schedule, Summary of Activities tabulation, and Scheduled Earnings tabulation, and Forty-Five Day Look-Ahead, all in accordance with paragraph (e) Submittal, and all brought up to date to reflect agreements made at the review meeting. Failure to submit the revision of the Construction Progress Schedules within 7 calendar days after the request will result in withholding of twenty-five percent of the amount of partial estimate payments until such schedules are submitted and approved.

(h) The CPM Construction Schedule will be provided at no direct pay.

Subsection 108.04, Prosecution of Work: Heading (b), Disqualification, is deleted and the following is substituted.

(b) Disqualification. The contractor's progress will be determined monthly at the time of each partial estimate, and will be based on the total amount of money earned by the contractor, excluding advanced stockpiled material, as shown by the partial estimate compared to scheduled earnings as shown by the approved Scheduled Earnings tabulation, as of the end of the partial estimate period. If the contractor's progress is more than 10 percent behind scheduled earnings, the contractor may be notified that disqualification will occur if progress becomes delinquent by more than the percentages specified hereinafter, and additional notifications will be made, as the engineer deems necessary.

Prior to the elapsing of 55 percent of the contract time, the contractor will be disqualified if progress is more than 20 percent behind scheduled earnings. After 75 percent of the contract time has elapsed, the contractor will be disqualified if progress is more than 10 percent behind scheduled earnings. Disqualification will be applied between 55 and 75 percent contract time elapsed on a pro-rata basis; for example, when 65 percent of the contract time has elapsed, the contractor will be disqualified if progress is more than 15 percent behind scheduled earnings.

During the period of disqualification, the contractor will not be permitted to bid on contracts nor be approved as a subcontractor on contracts. Any bid submitted by the contractor during the period of disqualification will not be considered and will be returned. The period of disqualification will continue until the completed work on the contract is within the foregoing percentages or until all work on the contract has been satisfactorily completed.

Subsection 108.07, Determination and Extension of Contract Time: This subsection is amended as follows.

The ninth and tenth paragraphs are deleted and the following substituted.

The contract time for the work as awarded is based on the original quantities as defined in Subsection 102.05 and includes time to procure material, equipment and an adequate labor force to complete the work. If satisfactory fulfillment of the contract requires performance of work in greater quantities than those specified, or requires performance of extra work in accordance with Subsection 104.02 and the contractor requests additional contract time, the contractor shall submit a proposed CPM schedule based on the latest approved CPM schedule showing the increased time and revised completion date for approval by the Department. When the contract is altered in accordance with Subsection 104.02 and the engineer determines that a reduction in contract time is warranted due to decreased effort, the contractor shall submit a proposed CPM schedule based on the latest approved CPM schedule showing the reduced time and revised completion date for approval by the Department. A CPM schedule will be required for the engineer to process a change order that either increases or decreases the contract time.

If the contractor finds it impossible, for reasons beyond the contractor's control, to complete the work within the contract time as specified or as extended in accordance with the provisions of this subsection, the contractor may, at any time prior to the expiration of the contract time as extended, make written request to the engineer for an extension of time setting forth therein the reasons which justify granting the request. The contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the engineer finds that the work was delayed because of conditions beyond the control and without the fault of the contractor, the engineer may extend the contract time in such amount as conditions justify. The contractor's written request to the engineer for an extension of contract time shall include a proposed CPM schedule based on the latest approved CPM schedule update showing the increased time and revised completion date for approval by the Department. This CPM schedule document will be required for the engineer to process a change order that changes the contract time.

DETERMINATION AND EXTENSION OF CONTRACT TIME (1/04): Subsection 108.07 Determination and Extension of Contract Time is amended to include the following.

The contractor shall document for each month of scheduled construction, the occurrence of adverse weather conditions having an impact on controlling items of work. An adverse weather day is one on which rainfall or wet soil conditions will prevent construction operations from proceeding for at least 5 continuous hours of the day or 65 percent of the normal work day, whichever is greater, with the normal working force engaged in performing the controlling item of work. If the contractor submits a written request for additional contract time due to adverse weather conditions, the contractor's request will be considered only for adverse weather days in excess of the allowable number of days per month stated below. An equitable adjustment in contract time will be made at the conclusion of the project by comparing the total number of excess adverse weather days requested by the contractor to the number of adverse weather days that were included in the construction schedule but were not used. Contract time will not be reduced due to the adjustments for adverse weather. An adjustment in the contract time due to adverse weather will not be cause for an adjustment in the contract amount.

The following are anticipated adverse weather days that the contractor shall include in each month of his calendar day construction schedule.

January	9 days	May	4 days	September	4 days
February	8 days	June	5 days	October	3 days
March	6.days	July	5 days	November	5 days
April	5 days	August	4 days	December	7 days

FAILURE TO COMPLETE ON TIME: Subsection 108.08 of the Standard Specification is amended as follows:

Table 108-1, Stipulated Damages, is amended as follows: The Daily Charge (Dollars) for Calendar Day is deleted, and the following substituted. Daily Charge (Dollars) for Calendar Day shall equal the Daily Road User Cost stated herein.

PAYMENT ADJUSTMENT (03/07): Section 109, Measurement and Payment of the 2006 Standard Specifications and the supplemental specifications thereto, is amended to add the following.

This project is designated for payment adjustment for asphalt cements and fuels in accordance with Subsection 109.09 as follows.

109.09 PAYMENT ADJUSTMENT (ASPHALT CEMENTS AND FUELS).

(a) General: Payment for contract items indicated herein will be adjusted to compensate for cost differentials of Performance Graded (PG) asphalt cements, gasoline, and diesel fuel when such costs increase or decrease more than 5 percent from the Department's established base prices for these items. The base price indices for asphalt cements and fuels will be the monthly price indices in effect at the time bids are opened for the project. The base price indices for asphalt cements will be as stated in paragraph (b) below. The base price index for fuels will be as stated in paragraph (c) below.

Payment adjustments will be made each monthly estimate period when a price index for this period varies more than 5 percent from its respective base price index. The monthly price indices to be used with each monthly estimate will be the price indices for the month in which the estimate period begins.

If the project is placed in default, payment adjustments will be based on the monthly price indices used for the last monthly estimate period prior to the project being placed in default, unless a monthly price index decreases in which case the lower monthly price index will be used.

If it is determined after completion of work on any eligible item that the total quantity paid to date must be adjusted to reflect more accurate quantity determinations, the Department will prorate the additional quantity to be added or subtracted over all previous estimate periods in which the item of work was performed in order to determine additional payment adjustments. If payment adjustments were made during any of these partial estimate periods, this added or subtracted quantity that has been prorated will likewise have payment adjustments calculated and included.

(b) Performance Graded (PG) Asphalt Cements: The base price index will be the monthly price index in effect at the time of bid opening as shown elsewhere herein. The monthly price indices will be the average, excluding the extreme outliers, of the unit prices for PG 64-22, the average, excluding the extreme outliers, of the unit prices for PG 70-22m, and the average, excluding the extreme outliers, of the unit prices for PG 76-22m. The monthly prices for each of these asphalt materials will be F.O.B. refinery or terminal as determined from the quoted prices effective on the first calendar day of each month from suppliers of these materials. Suppliers considered are those who have requested to participate in the liquid asphalt index determination and have supplied materials on DOTD projects within the past twelve months. These suppliers and materials shall be listed on the Department's Qualified Products List (QPL 41) and must be marketed in Louisiana.

Payment adjustments will be made in accordance with the following formulas:

If Monthly Price Index exceeds Base Price Index,

$$P_a = (A - 1.05B) \times C \times D \times (1.00 + T)$$

If Base Price Index exceeds Monthly Price Index,

$$P_a = (0.95B - A) \times C \times D \times (1.00 + T)$$

Where:

P_a	=	Price adjustment (increase or decrease) for asphalt cement.
A	=	Monthly Price Index for respective PG 64-22, PG 70-22m, or PG 76-22m in dollars per ton/megagram.
B	=	Base Price Index for respective PG 64-22, PG 70-22m, or PG 76-22m in dollars per ton/megagram.
C	=	Tons/megagrams of asphaltic concrete.
D	=	Percent of respective asphalt cement, per job mix formula, in decimals.
T	=	Louisiana sales tax percentage, in decimals. (Note: Local tax is not considered)

The engineer will furnish the weights (mass) of asphaltic concrete placed during the monthly estimate period with the respective asphalt cement content, excluding the asphalt content in reclaimed asphaltic pavement (RAP) as per job mix formula. If the asphalt cement content changes during the estimate period, the respective weight (mass) of asphaltic concrete produced at each cement content will be reported.

Item 510-02, Pavement Widening, and all contract pay items under Sections 502 and 508, will be eligible for payment adjustments of asphalt materials. No payment adjustment will be made for other asphalt materials, including emulsions and cutbacks.

The base price indices for asphalt cements and fuels will be posted on the DOTD internet website before the 10th calendar day of each month at the following URL: www.dotd.louisiana.gov/lettings/lac_price_index/priceindices.asp.

(c) Fuels: The base price index for this project will be the monthly price index in effect when bids are opened for the project. The monthly price index will be the minimum price quotations for unleaded gasoline and No. 2 diesel fuel listed for the New Orleans area in *Platt's Oilgram and Price Report* effective on the first calendar day of each month.

Payment adjustment will be made in accordance with the following formulas:

If Monthly Price Index exceeds Base Price Index,

$$P_a = (A - 1.05B) \times Q \times F$$

If Base Price Index exceeds Monthly Price Index,

$$P_a = (0.95B - A) \times Q \times F)$$

Where:

P_a	=	Price adjustment.
A	=	Monthly Price Index in dollars per gallon/liter.
B	=	Base Price Index in dollars per gallon/liter.
Q	=	Pay Item Quantity (Pay Units).
F	=	Fuel Usage Factor Gal (L)/Pay Unit.

The following is a listing of contract pay items that are eligible for payment adjustment and the fuel usage factors that will be used in making such adjustment. Contract items that expand the items listed herein by use of letter designations are also eligible for fuel price adjustments; for example:

Item 601-01-G, Portland Cement Concrete Pavement 8 inches (200 mm) thick.

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
SPECIAL PROVISIONS
ELIGIBLE CONTRACT PAY ITEMS & FUEL USAGE FACTORS FOR FUEL PAYMENT ADJUSTMENT

ITEM NO.	PAY ITEM	UNITS	MIN. ORIGINAL CONTRACT QUANTITY FOR PAY ADJUSTMENT	FUEL USAGE FACTORS	
				Diesel[2]	Gasoline
203-01[1]	General Excavation	gal/cu yd	10,000 cu yd	0.29	0.15
203-02	Drainage Excavation	gal/cu yd	10,000 cu yd	0.29	0.15
203-03[1]	Embankment	gal/cu yd	10,000 cu yd	0.29	0.15
203-04	Nonplastic Embankment	gal/cu yd	10,000 cu yd	0.29	0.15
203-07	Borrow (Vehicular Measurement)	gal/cu yd	10,000 cu yd	0.29	0.15
301-01	Class I Base Course	gal/cu yd	3,000 cu yd	0.88	0.57
301-02	Class I Base Course (" Thick)	gal/sq yd	50,000 sq yd	0.04	0.03
302-01	Class II Base Course	gal/cu yd	3,000 cu yd	0.88	0.57
302-02	Class II Base Course (" Thick)	gal/sq yd	50,000 sq yd	0.04	0.03
303-01	In-Place Cement Stabilized Base Course	gal/sq yd	50,000 sq yd	0.04	0.03
304-02	Lime Treatment (Type B)	gal/sq yd	50,000 sq yd	0.04	0.03
304-03	Lime Treatment (Type C)	gal/sq yd	50,000 sq yd	0.04	0.03
304-04	Lime Treatment (Type D)	gal/sq yd	50,000 sq yd	0.04	0.03
305-01	Subgrade Layer (" Thick)	gal/sq yd	50,000 sq yd	0.04	0.03
308-01	In-Place Cement Treated Base Course	gal/sq yd	50,000 sq yd	0.04	0.03
401-01	Aggregate Surface Course (Net Section)	gal/cu yd	3,000 cu yd	0.88	0.57
401-02	Aggregate Surface Course (Adjusted Vehicular Measurement)	gal/cu yd	3,000 cu yd	0.88	0.57
502-01	Superpave Asphaltic Concrete	gal/ton	1000 ton	2.40[3]	0.2
502-02	Superpave Asphaltic Concrete	gal/cu yd	500 cu yd	4.80[4]	0.4
502-03	Superpave Asphaltic Concrete (" Thick)	gal/sq yd	10,000 sq yd	0.13[5,6]	0.01[6]
508-01	Asphaltic Concrete (SMA)	gal/ton	1000 ton	2.40[3]	0.2
510-02	Pavement Widening	gal/sq yd	3,000 sq yd	0.86	0.24
601-01	Portland Cement Concrete Pavement (" Thick)	gal/sq yd	15,000 sq yd	0.11	0.15

1 If project has both 203-01 & 203-03, only the item with larger quantity is eligible.
2 For fuel adjustment purposes, the term "diesel" shall represent No. 2 or No. 4 fuel oils or any of the liquified petroleum gases, such as propane or butane.
3 If natural gas or coal is used instead of diesel for aggregate drying and heating the fuel usage factor shall be 1.67 gal/ton.
4 If natural gas or coal is used instead of diesel for aggregate drying and heating the fuel usage factor shall be 13.34 gal/cu yd.
5 If natural gas or coal is used instead of diesel for aggregate drying and heating the fuel usage factor shall be 0.09 gal/sq yd.
6 Per inch of thickness.

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
SPECIAL PROVISIONS
ELIGIBLE CONTRACT PAY ITEMS & FUEL USAGE FACTORS FOR FUEL PAYMENT ADJUSTMENT (METRIC)

ITEM NO.	PAY ITEM	UNITS	MIN. ORIGINAL CONTRACT QUANTITY FOR PAY ADJUSTMENT	FUEL USAGE FACTORS	
				Diesel[2]	Gasoline
203-01[1]	General Excavation	l/m^3	7,600 m^3	1.44	0.74
203-02	Drainage Excavation	l/m^3	7,600 m^3	1.44	0.74
203-03[1]	Embankment	l/m^3	7,600 m^3	1.44	0.74
203-04	Nonplastic Embankment	l/m^3	7,600 m^3	1.44	0.74
203-07	Borrow (Vehicular Measurement)	l/m^3	7,600 m^3	1.44	0.74
301-01	Class I Base Course	l/m^3	2,300 m^3	4.36	2.82
301-02	Class I Base Course (mm Thick)	l/m^2	41,800 m^2	0.18	0.14
302-01	Class II Base Course	l/m^3	2,300 m^3	4.36	2.82
302-02	Class II Base Course (mm Thick)	l/m^2	41,800 m^2	0.18	0.14
303-01	In-Place Cement Stabilized Base Course	l/m^2	41,800 m^2	0.18	0.14
304-02	Lime Treatment (Type B)	l/m^2	41,800 m^2	0.18	0.14
304-03	Lime Treatment (Type C)	l/m^2	41,800 m^2	0.18	0.14
304-04	Lime Treatment (Type D)	l/m^2	41,800 m^2	0.18	0.14
305-01	Subgrade Layer (mm Thick)	l/m^2	41,800 m^2	0.18	0.14
308-01	In-Place Cement Stabilized Base Course	l/m^2	41,800 m^2	0.18	0.14
401-01	Aggregate Surface Course (Net Section)	l/m^3	2,300 m^3	4.36	2.82
401-02	Aggregate Surface Course (Adjusted Vehicular Measurement)	l/m^3	2,300 m^3	4.36	2.82
502-01	Superpave Asphaltic Concrete	l/Mg	900 Mg	10.01[3]	0.83
502-02	Superpave Asphaltic Concrete	l/m^3	400 m^3	23.77[4]	1.98
502-03	Superpave Asphaltic Concrete (mm Thick)	l/m^2	8,400 m^2	0.59[5,6]	0.45[6]
508-01	Asphaltic Concrete (SMA)	l/Mg	900 Mg	10.01[3]	0.83
510-02	Pavement Widening	l/m^2	2,500 m^2	3.89	1.09
601-01	Portland Cement Concrete Pavement (mm Thick)	l/m^2	12,500 m^2	0.5	0.68

1 If project has both 203-01 & 203-03, only the item with larger quantity is eligible.
2 For fuel adjustment purposes, the term "diesel" shall represent No. 2 or No. 4 fuel oils or any of the liquified petroleum gases, such as propane or butane.
3 If natural gas or coal is used instead of diesel for aggregate drying and heating the fuel usage factor shall be 6.97 l/mg.
4 If natural gas or coal is used instead of diesel for aggregate drying and heating the fuel usage factor shall be 16.53 l/m^3.
5 If natural gas or coal is used instead of diesel for aggregate drying and heating the fuel usage factor shall be 0.41 l/m^2.
6 Per mm of thickness.

CULVERTS AND STORM DRAINS (01/07): Section 701, Culverts and Storm Drains, of the 2006 Standard Specifications, and the supplemental specifications thereto, is deleted and the following substituted.

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
SPECIAL PROVISIONS
SECTION 701
CULVERTS AND STORM DRAINS

701.01 DESCRIPTION. This work consists of furnishing, installing, and cleaning pipe, pipe arch, storm drains and sewers, also referred to as culverts or conduit, in accordance with these specifications and in conformity with lines and grades shown on the plans or established.

701.02 MATERIALS. Materials shall comply with the following sections and subsections:

Usable Soil	203.06(a)
Selected Soil	203.06(b)
Plastic Soil Blanket	203.10
Mortar	702.02
Flowable Fill	710
Portland Cement Concrete	901
Reclaimed Asphaltic Pavement (RAP)	1003.01 & 1003.04(d)
Stone	1003.03(b)
Recycled Portland Cement Concrete	1003.03(c)
Granular Material	1003.07
Bedding Material	1003.08
Concrete Sewer Pipe	1006.02
Reinforced Concrete Pipe	1006.03
Reinforced Concrete Pipe Arch	1006.04
Gasket Materials	1006.06
Plastic Pipe	1006.07
Split Plastic Coupling Bands	1006.07(d)(4)
Plastic Yard Drain Pipe	1006.09
Bituminous Coated Corrugated Steel Pipe and Pipe Arch	1007.02
Structural Plate for Pipe, Pipe Arch and Arch	1007.04
Corrugated Aluminum Pipe and Pipe Arch	1007.05
Coupling Bands	1007.09
Reinforcing Steel	1009
Geotextile Fabric	1019

(a) Side Drain Pipe or Side Drain Pipe Arch: When the item for Side Drain Pipe or Side Drain Pipe Arch is included in the contract, the contractor has the option of furnishing reinforced concrete pipe or reinforced concrete pipe arch, corrugated metal pipe or corrugated metal pipe arch, or plastic pipe, as allowed by EDSM II.2.1.1 or unless otherwise specified.

(b) Cross Drain Pipe or Cross Drain Pipe Arch: When the item for Cross Drain Pipe or Cross Drain Pipe Arch is included in the contract, the contractor has the option of furnishing reinforced concrete pipe or reinforced concrete pipe arch, corrugated metal pipe or corrugated metal pipe arch, or plastic pipe, as allowed by EDSM II.2.1.1 or unless otherwise specified.

(c) Storm Drain Pipe or Storm Drain Pipe Arch: When the item for Storm Drain Pipe or Storm Drain Pipe Arch is included in the contract, the contractor has the option of furnishing reinforced concrete pipe or reinforced concrete pipe arch, or plastic pipe, as allowed by EDSM II.2.1.1 or unless otherwise specified.

(d) Yard Drain Pipe: When the item for Yard Drain Pipe is included in the contract, the contractor has the option of furnishing concrete sewer pipe, plastic yard drain pipe or plastic pipe in accordance with Section 1006 unless otherwise specified.

(e) Material Type Abbreviations:

(1) Reinforced Concrete Pipe:

RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch

(2) Corrugated Metal Pipe:

CAP	Corrugated Aluminum Pipe
CAPA	Corrugated Aluminum Pipe Arch
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CSP	Corrugated Steel Pipe
CSPA	Corrugated Steel Pipe Arch
BCCSP	Bituminous Coated Corrugated Steel Pipe
BCCSPA	Bituminous Coated Corrugated Steel Pipe Arch

(3) Plastic Pipe:

PP	Plastic Pipe
PVCP	Polyvinyl Chloride Pipe
RPVCP	Ribbed Polyvinyl Chloride Pipe
CPEPDW	Corrugated Polyethylene Pipe Double Wall

(f) Joint Type Abbreviations:

T1	Type 1 Joint
T2	Type 2 Joint
T3	Type 3 Joint

(g) Quality Assurance for Pipe: Manufacturing plants will be periodically inspected for compliance with specified manufacturing methods, and material samples will be randomly obtained for laboratory testing for verification of manufacturing lots. Materials approved at the manufacturing plant will be subject to visual acceptance inspections at the jobsite or point of delivery.

701.03 EXCAVATION. For all pipe, when the sides of the trench are stable as evidenced by the sides of the trench being able to maintain a vertical cut face, the minimum trench width at the bottom of the excavation will be 18 inches (460mm) on either side of the outside diameter of the pipe. If the sides of the trench are unstable, the width of the trench at the bottom of the excavation, for plastic or metal pipe, shall be a minimum width of at least 18 inches (460mm) or one pipe diameter on each side of the outside diameter of the pipe, which ever is greater. Surplus material or excavated material that does not conform to the requirements of Subsection 203.06(a) shall be satisfactorily disposed of in accordance with Subsection 202.02. Moisture controls including backfill materials selection and dewatering using sumps, wells, well points or other approved processes may be necessary to control excess moisture during excavation, installation of bedding, over-excavated trench backfilling, pipe placement and pipe backfill.

(a) Over-excavation: When unsuitable soils as defined in Subsection 203.04 or a stable, non-yielding foundation cannot be obtained at the established pipe grade, or at the grade established for placement of the bedding, unstable or unsuitable soils below this grade shall be removed and replaced with granular material meeting the requirements of Subsection 1003.07, bedding materials meeting the requirements of Subsection 1003.08 or Type A backfill. All granular, backfill materials placed below the established pipe or bedding grade shall be placed in lifts not exceeding 8 inches (200 mm) thick and sufficiently compacted by hand or a dynamic mechanical hand compaction device over the surface of each lift to form a stable, non-yielding foundation at the surface of the established bedding or pipe grade.

When rock is encountered, it shall be removed below grade and replaced with material complying with Subsection 1003.07, bedding materials meeting the requirements of Subsection 1003.08 or Type A backfill. The compacted earth cushion shall have a thickness under the pipe of at least 1/2 inch per foot (40 mm/m) of fill height over the top of the pipe with a minimum thickness of 8 inches (200 mm). All granular, backfill materials placed below the established pipe or bedding grade shall be placed in lifts not exceeding 8 inches (200 mm) thick and sufficiently compacted by hand or a dynamic mechanical hand operated compaction device over the surface of each lift to form a stable, non-yielding foundation at the surface of the established bedding or pipe grade.

Materials used to backfill in an over-excavated portion of a trench do not require encasement in a Geotextile Fabric.

Density of approved materials placed in over-excavated trenches will not be measured or determined.

701.04 FORMING PIPE BED. Bedding material, when specified, shall be constructed in accordance with Section 726. Materials allowed for bedding shall be as specified in Subsection 1003.08 or may be Type A backfill materials. When bedding materials are specified, additional excavation shall be performed below established pipe grade and the bedding material placed in lifts not exceeding 8 inches (200 mm) thick and lightly compacted by hand or a dynamic hand compaction device over the surface of each lift.

When the bottom of the pipe is not laid in a trench but is constructed above natural soils, a uniform bed shall be constructed as specified for the bottom of a trench.

Density of approved bedding materials will not be measured or determined.

701.05 LAYING PIPE. Pipe laying shall begin at the downstream end of the line. The pipe shall be in contact with the foundation throughout its length. Bell or groove ends of pipe and outside circumferential laps of riveted metal pipe shall be placed facing upstream. Riveted seam metal pipe shall be placed with longitudinal laps at sides. Pipes in each continuous line shall have the same wall thickness. Metal pipes provided with lifting lugs shall be handled only by these lugs.

After pipe has been laid and before backfill is placed, the engineer will inspect the pipe for alignment, grade, integrity of joints, and coating damage.

701.06 JOINING PIPE.

(a) Joint Usage:

(1) Type 1 (T1) joints shall be used for side drains under drives and similar installations.

(2) Type 2 (T2) joints shall be used for cross drains under roadways, including turnouts.

(3) Type 3 (T3) joints shall be used for closed storm drain systems, flumes and siphons.

(b) Concrete Pipe: Concrete pipe may be either bell and spigot, or tongue and groove. The method of joining pipe sections shall be such that ends are fully entered and inner surfaces are flush and even.

An approved mechanical pipe puller shall be used for joining pipes over 36 inches (900 mm) in diameter. For pipe 36 inches (900 mm) or less in diameter, any approved method for joining pipe may be used which does not damage the pipe.

Joints shall comply with Subsection 1006.05, and shall be sealed with gasket material installed in accordance with the manufacturer's recommendations.

(c) Metal Pipe: Metal pipe shall be firmly joined by coupling bands. Bands shall be centered over the joint.

For Type 1 joints, approved gasket material shall be placed in one corrugation recess on each side of the joint at the coupling band and on each band connection in such manner to prevent leakage.

When Type 2 or 3 joints are specified, joining of metal pipe sections shall conform to the following provisions:

(1) General: Band joints shall be sealed with gasket material. Gasket material shall be placed in accordance with the plan details.

(2) Circular Section: Connecting bands shall be of an approved design and shall be installed in accordance with plan details.

(3) Arch Section: Connecting bands shall be a minimum of 12 inches (300 mm) wide for pipe arch less than 36 inches (900 mm) round equivalent diameter, and a minimum of 21 inches (525 mm) wide for 36 inches (900 mm) round equivalent diameter pipe arch and greater. Bands shall be connected at the ends by approved angle or strap connections. Connecting bands used for 36 inches (900 mm) round equivalent diameter pipe arch and above shall be 2-piece bands.

(d) Plastic Pipe: Joints for plastic pipe shall be either bell and spigot or split coupling bands.

(1) Bell and Spigot Type Joint System: The method of joining pipe sections shall be such that ends are fully entered and inner surfaces are flush and even.

Any approved method for joining pipe may be used which does not damage the pipe.

Joints shall be approved and shall be sealed with a gasket system utilizing gasket material complying with Subsection 1006.06(a).

(2) Split Coupling Type Joint System: Split coupling bands shall comply with all dimensional and material requirements of Subsection 1006.07. The bands shall be centered over the joint. The split coupling band shall be secured to the pipe with a minimum of five stainless steel or other approved corrosion resistant bands.

Joints shall be approved and shall be sealed with gasket material. Gasket material shall be placed in the first two corrugation recesses on each side of the pipe connections. Gasket material shall also be placed on each band connection to prevent leakage. When flexible plastic gasket material is used it shall be a minimum of 1/2 inch (13 mm) in size. The bands shall be tightened to create overlap of the band and shall adequately compress the gasket material.

(e) Connections: Approved connections shall be used when joining new pipes to existing pipes. When concrete collars are required in order to extend the ends of existing pipes that have been damaged or to join different types or sizes of pipes, the concrete collars shall be constructed in accordance with plan details, the applicable requirements of Section 901, and as directed.

(f) Geotextile Fabric, Pipe Joints: For concrete, metal and plastic pipes, Types 2 and 3 joints shall be wrapped with geotextile fabric for a minimum of 12 inches (300 mm) on each side of joint for pipe 36 inches (900 mm) or less in diameter and a minimum of 18 inches (450 mm) on each side of the joint for pipe greater than 36 inches (900 mm) in diameter. Ends of the fabric shall be lapped at least 10 inches (250 mm). The edges and ends of fabric shall be suitably secured for the entire circumference of the pipe.

701.07 RELAYING PIPE. If specified or directed, existing pipes shall be removed and suitable sections relaid as specified for new pipes.

701.08 BACKFILLING.

(a) General: Prior to backfilling, pipes found to be damaged or out of alignment or grade shall be removed and reinstalled, or replaced.

Type A backfill material shall be stone, recycled portland cement concrete, flowable fill, or RAP.

Type B backfill materials are selected soils. Where Type B backfill materials are called for, Type A backfill materials may be substituted.

When corrugated metal pipe is used, the backfill material shall be tested and shall have a resistivity greater than 1500 ohm-cm and a pH greater than 5 when tested in accordance with DOTD TR 429 and DOTD TR 430 respectively.

When Type A backfill material is used, geotextile fabric surrounding this backfill shall be placed in accordance with Subsection 726.03 between the aggregate backfill material and all other natural or placed soils in the trench or embankment. Care shall be taken to prevent damage to geotextile fabric during placement of backfill material. For concrete pipe, the fabric shall enclose not only the initial backfill but shall be wrapped over the top of the pipe with at least 12 inches (300 mm) of overlap.

When a trench box or trench sheeting is used in unstable soils and/or for worker safety, and when moved during backfilling operations, filling and additional compaction of the disturbed zone of backfill must take place immediately and in a manner acceptable to the engineer.

Initial backfill is a structural backfill encasing the pipe from the bottom of the pipe to the springline for concrete pipe and to a point one foot (0.3 m) above the top of the pipe for both metal and plastic pipe. Final backfill is not a structural backfill and shall extend from the top of the initial backfill to the top of the natural ground or subgrade in cut areas or to the top of existing ground in fill areas. Any fill required above the final backfill is considered and treated as embankment.

(b) Backfill Applications:

(1) Under Concrete Pavements: Type B backfill may be used as initial and final backfill for all pipes, culverts or drains under concrete pavements. Placement and compaction shall be as specified in Heading (d) below.

(2) Cross Drains Under Flexible Pavements: All reaches, exclusive of those portions of the pipe which are under shoulders, of cross drains and all other culverts, pipes or drains that cross the centerlines of the new roadway or centerlines of existing roadways, such as intersections and are under flexible pavements shall receive an initial backfill of Type A material. Type B backfill materials may be used as final backfill for all pipes. Placement and compaction shall be as specified in Heading (c) and (d) below. Where the subgrade is above existing ground, embankment material as specified for the remainder of the project shall be used from the top of the final backfill to the top of the established embankment grade.

(3) Other Drains Under Flexible Pavements: All reaches of all culverts, pipes or drains under flexible pavements that do not cross the centerlines of new roadway or centerlines of existing roadways, and exclusive of those portions of the pipe which are totally under shoulders, shall receive an initial and final backfill of Type B material. Placement and compaction shall be as specified in Heading (d) below. Where the subgrade is above existing ground, embankment material as specified for the remainder of the project shall be used from the top of the final backfill to the top of the established embankment grade.

(4) Other Areas: All culverts, pipes or drains in nonpaved areas or paved areas that serve as driveways or shoulders shall receive an initial and final backfill of Type B material. Placement and compaction shall be as specified in Heading (d) below.

(5) Pipes Subject to Construction Traffic; The embankment or pipe backfill shall be constructed to a minimum of 24 inches (600 mm) over the pipe before heavy construction equipment is allowed to cross the installation. Where practical, installations with less than 24 inches (600 mm) of cover over the top of the pipe shall be constructed after heavy hauling is completed over the pipe location. After completion of hauling operations, the contractor shall

remove excess cover material. Pipe damaged by hauling and backfilling operations shall be removed and reinstalled, or replaced, at no direct pay.

(c) Placement and Compaction; Type A Backfill: For all pipes, culverts and conduits under paved and nonpaved areas, where Type A backfill material is used, the Type A backfill shall be thoroughly hand compacted under the pipe haunches and then dynamically compacted in layers not exceeding 8 inches (200 mm) compacted thickness. Compaction under the haunches of the pipe shall initially be by hand tamping or other acceptable means, until a level is reached that the dynamic tamping can commence. Each lift shall be compacted by applying at least eight passes of a hand operated, dynamic mechanical compaction device over the surface of each lift. With approval of the engineer, layer thickness may be increased to 12 inches (300 mm) with verification of satisfactory installation and performance. If flowable fill is used it shall be furnished, placed and consolidated in accordance with Section 710. The contractor shall control placement operations during initial backfill operations so as not to damage protective coatings on metal pipes. The contractor shall repair damaged coatings at no additional pay.

(d) Placement and Compaction; Type B Backfill: For all pipes, culverts and conduits, where Type B backfill is allowed, the Type B material shall be placed in layers not exceeding 8 inches (200 mm) compacted thickness. Compaction shall be with suitable mechanical equipment. With approval of the engineer, layer thickness may be increased to 12 inches (300 mm) with verification of satisfactory installation and performance.

(e) Placement and Compaction; Trenchless or Partial Trench Condition: All pipes, culverts, drains and conduits placed with any portion of the pipe above existing ground must also comply with Subsections (a),(b) (c) and (d) above for the portion of the pipe within a trench and that portion of the pipe not constructed in a trench. The width of initial and final backfill of that portion above existing ground and not within a trench will be constructed to such a width that the requirements for placement, compaction and density are met.

(f) Density Requirements: The in place density of Type A backfill materials and bedding materials, will not be measured or determined. Type A backfill, exclusive of RAP and flowable fill, shall be placed at or near optimum moisture content determined in accordance with DOTD TR 415 or 418. RAP materials shall be placed and compacted in a slightly moist condition.

The maximum dry density of initial or final Type B backfill under all paved areas which are to be under traffic will be determined in accordance with DOTD TR 415 or TR 418 and in-place density determined in accordance with DOTD TR 401. Initial and final Type B backfill under all paved areas, under traffic, shall be placed at or near optimum moisture content determined in accordance with DOTD TR 415 or TR 418. Each layer shall be compacted by approved methods prior to the placement of a subsequent layer. The engineer will approve the compaction method based upon validation that such method, including moisture control, will achieve at least 95 percent of maximum dry density as determined in accordance with DOTD TR 401. With approval of the engineer, density testing may be waived on subsequent layers with backfill installation in accordance with approved compaction methods and continued satisfactory performance.

Initial and final backfill in unpaved areas or paved areas such as shoulders or driveways, shall be placed evenly and compacted along the length of the culvert, pipe or drain from the top of the initial backfill to the top of the subgrade. Layered backfill shall be compacted at least to the density of the adjoining existing soils or the compaction required of the laterally adjoining layers of soil immediately outside the trench for embankment elevations. Initial and final backfill shall be placed and compacted at or near optimum moisture content determined in accordance with DOTD TR 415 or TR 418.

701.09 INSPECTION OF PIPES. After completion of embankment and prior to roadway surfacing, the engineer shall inspect pipes for proper alignment and integrity of joints. Any misaligned pipe or defective joints shall be corrected by the contractor at no direct pay.

(a) Plastic Pipe: Installed plastic pipe shall be tested to ensure that vertical deflections do not exceed 5.0 percent. Maximum allowable deflections shall be governed by the mandrel requirements stated herein.

Deflection tests shall be performed no sooner than 30 calendar days after installation and compaction of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

For pipe 36 inches (900 mm) and less in diameter, a mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. The mandrel shall be approved by the engineer prior to use. Use of an unapproved mandrel or a mandrel altered or modified after approval will invalidate the test. If the mandrel fails to pass, the pipe is overdeflected.

Unless otherwise permitted, overdeflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed and replaced with new pipe. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any overdeflection, shall be removed and replaced with new pipe.

The mandrel shall be a rigid, nonadjustable, odd-numbered legged (minimum 9 legs) mandrel having a length not less than its nominal diameter or 24 inches (600 mm), whichever is less. The minimum diameter at any point shall be 5.0 percent less than the base inside diameter of the pipe being tested. The mandrel shall be fabricated of steel, aluminum or other approved material fitted with pulling rings at each end. The nominal pipe size and outside diameter of the mandrel shall be stamped or engraved on some segment other than a runner. A suitable carrying case shall be furnished.

For pipe larger than 36 inches (900 mm) in diameter, deflection shall be determined by a method approved by the engineer. If a mandrel is selected, the minimum diameter, length, and other requirements shall conform to the above requirements.

Mandrel testing shall be conducted by the contractor in the presence of the engineer. Mandrel testing shall be at no direct pay.

(b) Metal Pipe: If the inside diameter of metal pipe or rise dimension of metal pipe arch deflects more than 5.0 percent from original dimensions, they shall be removed and reinstalled, unless they do not rebound or are damaged. Pipe or pipe arch which are damaged or do not rebound shall be removed and replaced at no direct pay. Measurement of deflection will be made by the engineer away from rerolled ends.

701.10 CLEANING PIPES.

(a) Existing Pipes: Pipes designated to be cleaned shall be cleaned of soil, debris and other materials to the invert of the pipe. Designated pipes shall be cleaned by approved methods that will not damage the pipes. Any damage caused by the contractor's operations shall be satisfactorily repaired at no direct pay.

Removed soil, debris and other materials shall be disposed of in accordance with Subsection 202.02 or as otherwise approved in writing.

(b) Contractor Installed Pipes: Prior to final acceptance, pipes shall be cleaned of all debris and soil to the invert of the pipe at no direct pay.

Removed soil, debris and other materials shall be disposed of in accordance with Subsection 202.02 or as otherwise approved in writing.

701.11 STUBBING AND PLUGGING PIPES. When it is required that pipes be plugged, such plugs shall be constructed of Class R concrete complying with Section 901. Thickness of plug and method of construction shall be as directed.

When new pipes are to be stubbed into new or existing pipes or other structures, the connection shall be made with approved mortar complying with Subsection 702.02.

701.12 MEASUREMENT. Pipe, both new and relaid, will be measured in linear feet (lin m) as follows unless stated otherwise.

(a) Pipe not confined by fixed structures will be measured by the number of joints at the nominal length of each joint.

(b) Pipe confined by fixed structures will be measured along the pipe between the termini of pipe in structure walls.

(c) Pipe confined by a fixed structure on one end and unconfined at the other end will be measured along the pipe from the terminus of pipe in the structure wall to the unconfined end of pipe.

(d) Fabricating of pipe tees, elbows and other fittings will be measured per each fitting. The length of pipe in such fittings will be included in the pay length measurement of pipes of which they form a part.

(e) Excavation required for installation of pipes will not be measured for payment, except as otherwise specified in Subsection 203.14.

(f) 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 and payment will be made under applicable earthwork items. When specified, flowable fill will be measured and paid for in accordance with Section 710.

(g) Plugging and stubbing of pipes will not be measured for payment.

(h) Cleaning existing pipes will be measured by the length of pipe cleaned and accepted.

(i) Concrete collars will be measured per each.

701.13 PAYMENT.

(a) Payment for pipe will be made at the contract unit price per linear foot (lin m) of the types and sizes specified.

When plastic pipe is specified on the plans or elected to be used by the contractor, payment will be made at the contract unit price per linear foot (lin m) of the types and sizes specified in accordance with the payment schedule of Table 701-1.

Table 701-1
Payment Schedule for Plastic Pipe

Percent Payment	Stage of Completeness
75	After placement and backfill has been completed
25	After the pipe has met vertical deflection requirements in accordance with Subsection 701.09(a)

(b) Payment for fabricating pipe tees, elbows and other fittings will be made at the contract unit price per each fitting.

(c) When unstable conditions are encountered, the additional excavation will not be measured for payment; however, the additional materials furnished and placed for the pipe foundation will be measured and paid for as follows:

(1) Granular Materials: Payment will be made under the embankment item. The net section volume of the materials will be multiplied by 3 to determine the pay volume. When the contract does not include a pay item for embankment, payment will be made in accordance with Subsection 104.02.

(2) Bedding Material: Measurement and payment will be made in accordance with Section 726. When the contract does not include a pay item for bedding material, payment will be made in accordance with Subsection 104.02.

(d) Payment for cleaning existing pipes will be made at the contract unit price per linear foot (lin m).

(e) Payment for concrete collars will be made at the contract unit price per each.

Payment will be made under:

Item No.	Pay Item	Pay Unit
701-01	Cross Drain Pipe (Size & Type)	Linear Foot (Lin m)
701-02	Cross Drain Pipe Arch (Size & Type)	Linear Foot (Lin m)
701-03	Storm Drain Pipe (Size & Type)	Linear Foot (Lin m)
701-04	Storm Drain Pipe Arch (Size & Type)	Linear Foot (Lin m)
701-05	Side Drain Pipe (Size)	Linear Foot (Lin m)
701-06	Side Drain Pipe Arch (Size)	Linear Foot (Lin m)
701-07	Yard Drain Pipe (Size)	Linear Foot (Lin m)
701-08	Relaying Pipe	Linear Foot (Lin m)
701-09	Fabricating Pipe Fittings	Each
701-10	Reinforced Concrete Pipe (Extension)	Linear Foot (Lin m)
701-11	Reinforced Concrete Pipe Arch (Extension)	Linear Foot (Lin m)
701-12	Corrugated Metal Pipe (Extension)	Linear Foot (Lin m)
701-13	Corrugated Metal Pipe Arch (Extension)	Linear Foot (Lin m)
701-14	Cleaning Existing Pipes	Linear Foot (Lin m)
701-15	Concrete Collar	Each
701-16	Plastic Pipe (Extension)	Linear Foot (Lin m)

TEMPORARY TRAFFIC CONTROL (08/06): Section 713 of the 2006 Standard Specifications and the Supplemental Specifications is amended as follows:

Subsection 713.04, Temporary Signs and Barricades, is amended to include the following:

(d) Project Signs: The contractor shall furnish, install, maintain, and upon completion of the project remove "project signs" in accordance with the following requirements.

Project signs shall conform to the requirements of Section 713 and the project sign detail contained elsewhere herein. Shop drawings will be furnished to the successful bidder by contacting the Department's Traffic Services Sign Shop at (225) 935-0121 or (225) 935-0142.

Project signs shall be required at the beginning and end of the project and shall follow sign G-20-1, "Road Work Next 'X' Miles", or as directed by the engineer.

Payment for project signs shall be included in the contract unit price for Item 713-01 Temporary Signs and Barricades.

PROJECT SITE LABORATORY (EQUIPPED): Subsection 722 of the 2006 Standard Specifications is amended as follows:

Subsection 722.02 General Requirements. The first sentence of the second paragraph is deleted and the following substituted.

Each laboratory shall have a minimum floor space of 160 square feet, or other approved size that provides sufficient space with a minimum ceiling of 7 feet.

The following is added to the second paragraph.

The contractor shall be required to furnish, install and maintain the following equipment in satisfactory condition, as needed, throughout the life of the project.

1.) An automatic soil compaction hammer capable of compacting both standard and modified proctors, with arrangement for both 12″ and 18″ drop and also accommodates 4″ and 6″ molds with adjustable hammer weight from 5.5 to 10 pounds. The specifications for the hammer shall be in accordance with TR415, Field Moisture-Density Relationships, and TR 418, Moisture Density Relationships, and shall have a striking face which is a 3.1416 in^2 (2026,83mm^2) sector face as specified for each mold diameter. The equipment shall include two (2) molds of each size (1/30 ft^3 and 1/33.33 ft^3 or 1/10ft^3).

2.) A compaction block or pedestal composed of Portland cement concrete shall be supplied for use with the automatic compaction hammer. The block shall weigh a minimum of 200 pounds. The hammer shall be secured to the block.

3.) An electronic scale capable of measuring in both English and metric units and shall have a capacity of 13.6 kgs or more with a sensitivity of 5 grams.

4.) An electronic scale capable of measuring in metric units and shall be capacity of 2 kilograms or more with a sensitivity of 0.1 grams.

5.) Two (2) electric or gas hot plates. An open flame hot plate shall be equipped with suitable shield to disperse heat evenly and to prevent direct contact of the flame with the drying pan. The hot plates shall be of sufficient size to accommodate the drying pans.

Note: The automatic soil compaction hammer and scales noted above shall be calibrated by an independent laboratory on an annual basis and shall be verified by the project engineer's personnel on each project.

6.) An approved nuclear device (Troxler Model 3440) with a transport case, locks and keys. Also, included shall be an operator's manual, referenced standard block, scraper plate/drill rod guide, and 3/4″ auger.

The nuclear device shall be wiped test every 6 months and calibrated every 2 years by an independent laboratory and shall be verified by the project engineer's personnel on each project.

HYDRO-SEEDING: Section 739 of the 2006 Standard Specifications is amended as follows:

Section 739 of the 2006 Standard Specifications and the Supplemental Specifications thereto is amended to include the "U.S. Forest Service Stipulations and Requirements" included elsewhere herein.

Subsection 739.03, Hydro-Seeding General. The first sentence is deleted and the following substituted.

Hydro-seeding shall consist of mixing and applying seed, commercial fertilizer, water management gel, Soil Guard or an approved equal, and mycorrihizal inoculum with wood fiber and water.

GENERAL REQUIREMENTS FOR STRUCTURES (08/06): Section 801 is amended as follows:

Subsection 801.01, Description: This subsection is amended to include the following.

When the plans for concrete bridges specify either 6 meter precast or 19-foot precast spans, substitution of 20- foot precast or 20-foot cast-in-place spans will be allowed. If a substitution is approved, the plans shall be revised to include the details of the bridge actually constructed. Plan details, when available, will be provided by DOTD. When details are not available from DOTD, it will be the responsibility of the contractor to furnish drawings stamped by a Civil Engineer, registered in the State of Louisiana, for the requested bridge. No additional payment will be allowed for requested changes.

PORTLAND CEMENT CONCRETE (08/06): Section 901 of the 2006 Standard Specifications and the supplemental specifications thereto is amended as follows.

Subsection 901.06 is amended as follows.

Heading (b) is amended to include the following.

The contractor shall be responsible for monitoring the components (cement, mineral and chemical admixtures, aggregates) in their mix to protect against any changes due to component variations. As component shipments arrive, the contractor shall verify slump, air content and set time by testing at ambient temperatures. The contractor shall make adjustments to the mix design to rectify any changes which would adversely affect constructability, concrete placement or the specifications. The contractor shall submit test results to the Department for review each day of paving. Testing to validate component consistency will be documented on the control logs. Conformance or variation in mix parameters (workability, set times, air content, etc.) shall be noted on the control logs. The contractor shall provide a copy of the proposed testing plan to the engineer for record. Acceptance of the plan does not relieve the contractor's responsibility for consistency.

COOPERATION WITH UTILITIES: Subsection 105.06 of the Standard Specifications is amended to include the following.

Utility facilities will be removed, relocated, adjusted or abandoned in accordance with agreements between the Department and utility owners listed below. Starting dates for such work will be determined by the engineer and may be different for each utility and may not be underway concurrently with the contractor's work or with other utility relocations.

UTILITY OWNER		Estimated Calendar Days After Right-Of-Way Is Clear
AT&T 825 Murray Street Alexandria, LA 71301 Phone: (318) 473-1665 Attn.: Clarence Frazier	Cell: (318) 623-7066	180
Central Grant Water System P. O. Box 237 Dry Prong, LA 71423 Phone: (318) 899-1000 Attn.: Jack Faircloth		60
Cleco Power P. O. Box 5000 Pineville, LA 71361-5000 Phone: (318) 484-4183 Attn.: Russell Lohman	Cell: (318) 308-3022 russell.lohman@cleco.com	100
Entergy Louisiana, Inc. 5034 Quitman Highway P. O. Box 1130 Hodge, LA 71247 Phone: (318) 259-5055 Attn.: Billy Stanford	Cell: (318) 548-9900	10
Grant Gas Utility District No. 3 506 Main Street Colfax, LA 71417 Phone: (318) 827-3333 Attn.: Don Foster	Cell: (318) 447-9160	30
Red Hill Waterworks P. O. Box 357 Georgetown, LA 71432 Phone: (318) 419-5295 Attn.: John Bruce		30

ITEM S-001, FULL DEPTH SAWCUTTING: This item consists of sawcutting and removal existing asphaltic concrete pavement at locations shown on the plans or as directed.

Sawcuts shall be made neat and along straight lines with a concrete saw for the full depth of the pavement to be removed. The designated areas of pavement to be removed shall be cut or broken into smaller portions as required for removal. The limits of sawcutting shall be adjusted to include areas of existing cracking.

Sawcutting existing asphaltic concrete pavement will be measured by the linear foot and payment shall be made at the contract unit price, which includes sawing at the designated limits, removal and disposal of the pavement.

Payment will be made under:

Item S-001, Full Depth Sawcutting, per linear foot.

ITEM S-002, REMOVAL OF S. P. NO. 023-04-0017 TRANSITION ROAD: This item shall consist of the complete removal of the existing temporary transition road at the north end of this project, as shown in the construction plans. This temporary transition road is from approximate Sta. 785+12 to Sta. 798+14. The complete removal of the existing temporary transition road includes the saw cutting along the lines shown, and removal of traffic striping, pavement, base, drainage structures (if any), geotextile fabric (if any), embankment, and the fine grading and shaping to drain. The installation of permanent seeding, mulching, and fertilizing will be paid under the appropriate pay items elsewhere in this contract. Permanent pavement striping will be paid under the appropriate permanent striping pay items elsewhere in this contract.

Payment will be made under:

Item S-002, Removal of S.P. 023-04-0017 Transition Road, per lump sum.

ITEM S-003, RUMBLE STRIPS (GROUND-IN) (04/01): This item consists of cutting 1/2 inch deep depressions into asphaltic concrete shoulders in accordance with plan details, this special provision, and as directed.

The cutting tool shall be equipped with a rotary type cutting head and a power unit. The cutting head shall have the cutting tips arranged in a pattern to provide a relatively smooth cut (approximately 1/16 inch between peaks and valleys). The cutting head shall be suspended independently from the power unit to allow the cutting head to self-align with the slope of the shoulder and any irregularities in the shoulder surface. The cutting tool shall be equipped with guides to provide a consistent alignment of each cut in relation to the roadway and to provide uniformity and consistency throughout the project.

The rumble strips shall be cut into the finished shoulders after the final wearing course has been placed.

Solid residue resulting from cutting operations shall be removed from pavement and shoulder surfaces by the contractor before such residue is blown by traffic or wind.

The contractor shall demonstrate to the project engineer the ability to achieve the desired surface inside each depression without tearing or snagging the asphalt prior to beginning the work.

Acceptance measurements will be performed by the Department on a random basis to ensure conformance with the specifications.

Rumble strips (ground-in) will be measured by the mile, plan quantity, constructed and accepted in accordance with these specifications. The plan quantity is based on the roadway length minus bridge lengths for each shoulder on which ground-in rumble strips are constructed.

Payment for rumble strips (ground-in) will be made at the contract unit price in accordance with Subsection 109.02.

Payment will be made under:

Item S-003, Rumble Strips (Ground-in), per mile.

ITEM S-004, OPEN GRADED FRICTION COURSE (LOW VOLUME TRAFFIC APPLICATIONS (03/06): This item consists of furnishing and constructing an Open Graded Friction Course in accordance with plan details and specifications. This material shall be placed in thicknesses as detailed in the plans; otherwise the thickness shall be 1 inch (25 mm) minimum and 2 inch (50 mm) maximum.

Asphalt plant personnel shall be Certified Technicians in accordance with Section 502.

Quality assurance requirements and design procedures shall be as specified herein elsewhere and in the latest edition of the Department's publication entitled "Application of Quality Assurance Specifications for Asphaltic Concrete Mixtures" which is hereby made a part of this contract by reference.

Equipment: All plant and roadway equipment must comply with Section 503 and as modified herein. The asphalt distributor shall be calibrated. The contractor shall provide the ASTM calibration and shall furnish the engineer an accurate and satisfactory calibration record prior to beginning the work. The engineer may at any time require verification of calibration accuracy of the asphalt distributor in accordance with ASTM D 2995.

Materials: The contractor shall keep accurate records, including proof of deliveries of all materials used in this process. The following specifications apply:

(a) Polymer Modified Emulsion Tack Coat: A polymer modified emulsion tack coat will be required. The polymer modified emulsion tack coat material shall be undiluted modified asphalt emulsion Grade CRS-2P complying with Section 504 and Section 1002.

(b) Open Graded Friction Course:

(1) Asphalt Cement: The asphalt cement shall be a PG 76-22m from a source listed on QPL 41 complying with Section 1002.

(2) Aggregate: Aggregates shall be 100 percent crushed stone or slag from a source listed on QPL 2. Aggregates shall also comply with Subsections 1003.01, 1003.06 and Subsection 1003.06(b).

Friction rating requirements shall be in accordance with Subsection 502.02(c)(1). The composite gradation shall conform to Table 1.

Table 1
Aggregate Gradation

U.S. (Metric) Sieve	%Passing	JMF Sieve Tolerances
3/4 inch (19 mm)	100	±4%
1/2 inch (12.5 mm)	85-100	±4%
3/8 inch (9.5 mm)	55-75	±4%
No. 4 (4.75 mm)	10-25	±4%
No. 8 (2.36 mm)	5-10	±3%
No. 16 (1.18 mm)	----	----
No. 30 (600 µm)	----	----
No. 50 (300 µm)	----	----
No. 200 (75 µm)	2-4	±1.5%

(3) Mineral Filler: Mineral filler, if used, shall meet the requirements of Subsection 1003.06(a)(6).

(4) Fiber: The use of a cellulose or mineral fiber will be required to assure protection against asphalt cement draindown. Cellulose fiber or mineral fiber shall comply with Section 508.

(5) Additives: Anti-stripping additives will be required and shall be from a source listed on QPL 57. Anti-strip shall be added in accordance with Section 502 and as modified herein.

Mix Design: The contractor shall submit a job mix formula (JMF), as determined by the mix design procedure specified herein, for the mixture to be supplied for the project. The mix

shall be compacted with a Superpave gyratory compactor at 50 gyrations. The design asphalt content shall be a minimum of 6.5 percent with a maximum draindown of 0.3 percent by weight (mass) in accordance with ASTM D 6390. The theoretical maximum specific gravity, G_{mm}, shall be determined in accordance with DOTD TR 327 and shall be reported on the JMF. The JMF shall indicate proportions of aggregate, anti-strip additive and asphalt cement, composite gradations, and mix temperatures. The JMF shall include the target for polymer modified emulsion tack coat application rate. The JMF shall also include the results of the tests for percent VCA_{MIX}, percent VCA_{DRC}, percent V_a, permeability, draindown, boil test, and Tensile Strength Ratio (TSR) value. Volumetrics, stability and flow are not required. The JMF shall be submitted to the DOTD District Laboratory Engineer for approval. The District Laboratory Engineer will approve the mix design based on the use of approved material sources and compliance with specifications.

(a) Anti-Strip: Anti-strip will be required at a minimum rate of 0.5 percent by weight of asphalt and shall be used at a rate that is 0.1 percent greater than that which will produce a 90 percent coating when tested in accordance with DOTD TR-317, (Boil Test). Also, the retained tensile strength shall meet or exceed 80 percent when tested in accordance with DOTD TR 322 and as modified below.

1. Specimens for DOTD TR 322 shall be 6 inches (150 mm) in diameter and shall be compacted in accordance with AASHTO TP 4 to 50 gyrations to a height of approximately 90 mm.

2. Apply a vacuum of 87.8 kPa (660 mm (26 inches) of mercury) for 10 minutes to saturate the compacted specimens to whatever saturation level is achieved.

3. Submerge the specimens in water during the freeze cycles to maintain saturation.

(b) Mix Design Procedure: The contractor shall provide the required Open Graded Friction Course mixture using the following design procedure.

1. Select three trial blends of aggregate within the aggregate gradation bands as detailed in Table 1, "Aggregate Gradation".

2. Determine the dry-rodded voids in the coarse aggregate, plus No. 4 (4.75 mm) sieve, of the coarse aggregate fraction, VCA_{DRC}, in accordance with ASTM C 29.

3. Add between 6.5 percent to 7.0 percent PG 76-22m asphalt cement to each trial blend and compact blend to 50 gyrations in a Superpave gyratory compactor. (Note: At this stage of design, fiber should be added at the manufacturer's recommended rate. Fibers are required. Typical fiber rates are 0.2 percent to 0.5 percent of the total weight (mass) of the mix.).

4. Determine the percent air voids (V_a), and percent voids in the coarse aggregate for each of the compacted mixes (VCA_{MIX}).

a. Determine the bulk specific gravity of the mix (G_{mb}), using geometric measurements of diameter and the height test method ASTM D3203 (Note: final gyratory height at 50 gyrations as measured by the Superpave gyratory compactor may be allowed), or the vacuum sealing test method ASTM D 6752.

b. Determine the theoretical maximum specific gravity of the mixture (G_{mm}), in accordance with DOTD TR 327.

c. Determine the bulk specific gravity of the coarse aggregate fraction (G_{CA}), in accordance with ASTM C 127.

Calculate percent V_a, and percent VCA_{MIX} using the following equations:

$$\%V_a = 100 \times \left(1 - \frac{G_{mb}}{G_{mm}}\right)$$

$$\%VCA_{MIX} = 100 - \left(P_{CA} \times \frac{G_{mb}}{G_{CA}}\right)$$

where:

P_{CA} = percent coarse aggregate in the total mixture
G_{mb} = bulk specific gravity of the compacted mixture
G_{mm} = theoretical maximum specific gravity of the mixture
G_{CA} = bulk specific gravity of the coarse aggregate fraction

5. Select the aggregate gradation blend that achieves the highest percent V_a (minimum 18% required) and a percent VCA_{MIX} equal to or less than that determined by the dry-rodded technique, VCA_{DRC}. The percent VCA_{MIX} equal to or less than that determined by the dry-rodded technique, VCA_{DRC}, indicates stone-on-stone contact within an Open Graded Friction Course mixture. This selection is the desired blend.

6. To determine the optimum percent of asphalt in the mixture prepare two additional mixtures using 0.5 percent and 1.0 percent additional PG 76-22m asphalt cement using the desired aggregate blend as selected previously and compact using 50 gyrations of the Superpave gyratory compactor. The optimum percent of asphalt will be determined based on specification compliance for percent air voids, asphalt cement draindown, and permeability, and a percent VCA_{MIX} equal to or less than that determined by the dry-rodded technique, VCA_{DRC}. These results shall be reported.

7. Conduct an asphalt cement draindown test on the selected optimum design mixture in accordance with ASTM D 6390 on the loose mix at a temperature 60°F (15°C) higher than normal mixing temperatures. A maximum 0.3 percent draindown of asphalt cement by weight (mass) will be allowed.

8. Perform Boil Test in accordance with DOTD TR-317 and perform Lottman tests in accordance with DOTD TR 322 and as modified herein. These tests shall be run on the optimum design mixture as determined herein.

9. Conduct laboratory permeability test in accordance with ASTM PS 129. A minimum permeability of 246 feet/day (75 m/day) is required. Specimens used for permeability testing may be the same specimens used for DOTD TR 322 as previously specified herein.

10. Report and record each step of the mix design procedure.

Surface Preparation: The engineer shall approve the surface preparation prior to start of operation.

(a) Manhole covers, drains, grates, catch basins and other such utility structures shall be protected and covered. Any vegetation at the road edge shall be cut back.

(b) The surface shall be swept clean of dust, dirt, caked clay, and loose foreign material such as waste sugar cane.

(c) Extended thermoplastic markings and raised pavement markers shall be removed.

Weather Limitations: The Open Graded Friction Course system shall comply with the weather limitations of Subsection 502.04 except that the surface temperature shall be a minimum of 70°F (21°C) and the ambient temperature must be 70°F (21°C) and rising. The Open Graded Friction Course shall only be placed within the months of May through September.

Application: The polymer modified emulsion tack coat material shall be applied in accordance with Section 504 and as modified herein. The polymer modified emulsion tack coat material shall be sprayed by a calibrated metered mechanical pressure sprayer. The sprayer shall accurately and continuously monitor the rate of spray, which shall be uniform across the paving width. The undiluted polymer modified emulsion tack coat application rate shall be determined by road conditions and mix type and shall not be less than 0.08 US gal/sq yd (0.36 L/sq m) unless approved by the engineer.

The Open Graded Friction Course shall be delivered and applied at a temperature of 300°F (148°C) ± 25°F (14°C). The asphalt mixture shall be smoothed over the full lane width using a heated screed to ensure an even mat of uniform thickness.

The asphalt hot mix plant shall produce sufficient quantity of material prior to starting the paving unit and shall provide a continuous supply of material once the operation has begun to prevent any stopping and starting of the paving train.

The use of an MTV complying with Subsection 503.10 will be required.

Compaction of the Open Graded Friction Course shall be carried out using a minimum of 3 passes of a double drum steel wheel roller of sufficient weight to properly seat the aggregate without crushing the aggregate. Compaction of the Open Graded Friction Course will be performed in the static mode, no vibration will be allowed. A minimum of two double drum steel wheel rollers will be required for compaction. All compaction shall take place before the material temperature has fallen below 180°F (80°C).

Opening to Traffic: The new pavement shall not be opened to traffic nor shall any roller sit idle on the pavement until the rolling operation is complete and the material has cooled below 160°F (70°C).

Quality Control and Assurance: The proposed JMF shall be validated. The validation lot is defined as the first four hours of production. Validation requires that the mixture meets the minimum design criteria, excluding the Lottman test, and shall be based on the average of a minimum of two samples. For JMF validation, the loose mixture shall be sampled and tested for aggregate gradation, percent asphalt cement content, theoretical maximum specific gravity (G_{mm}), and percent VCA_{MIX} and the Superpave gyratory samples shall be tested for percent air voidsnt (V_a). For JMF validation, all mix properties shall meet the specification criteria. Permeability testing on the Superpave gyratory samples may be required for JMF validation as deemed necessary by the DOTD District Laboratory Engineer. After validating the JMF for mix properties, the contractor, witnessed by the engineer, shall sample the next day's production and perform validation testing at the plant for Lottman (DOTD TR 322) as modified herein. When the validation results are less than 80 percent, no further production for that job mix formula will be accepted on any DOTD project until a passing plant-produced Tensile Strength Ratio (TSR) value is verified by the Department. Subsequent validation trials shall be limited to 500 tons (500 Mg) per day. A previously validated and approved JMF may be produced in lieu of the disapproved JMF provided the material sources are the same as the previously approved JMF.

The engineer will sample the polymer modified emulsion tack coat material in accordance with the Materials Sampling Manual for acceptance by the District Laboratory. The engineer will verify all quantities of the polymer modified emulsion tack coat material used. The total quantity of the polymer modified emulsion tack coat material used shall be divided by the total area sprayed to determine the average polymer modified emulsion tack coat application rate. The average polymer modified emulsion tack coat application rate as calculated will be subject to pay adjustments as detailed in Table 2.

The aggregate shall be stored in a well drained dedicated stockpile and shall be tested by the contractor for water absorption, aggregate specific gravities, and gradation prior to paving.

Any changes in material as defined in the "Application of Quality Assurance Specifications for Asphaltic Concrete Mixtures" shall require a new Job Mix Formula submittal and approval.

The mixture shall also be tested for moisture content once every morning, which shall not exceed 0.5 percent.

For Quality Assurance at the asphalt plant, samples of the hot mix shall be tested for gradation, asphalt cement content, and theoretical maximum specific gravity (G_{mm}) at the following frequency. Two (2) samples shall be taken from the first 500 tons (500 Mg) of production. Thereafter, one (1) sample shall be taken from every 500 tons (500 Mg). The test results shall be averaged and the percent payment shall be determined as stated elsewhere herein. The extracted asphalt cement content shall be within $\pm$ 0.2 percent from approved validated JMF target.

The DOTD Certified Asphaltic Concrete Technician will sample and test the mixture during production for quality assurance purposes. The contractor's Certified Asphaltic Concrete Technician shall design and monitor the mixture for guality control purposes.

Prior to the beginning of laydown operations and after laydown operations are completed, the contractor shall profile the project using a Department approved automated profiler in accordance with DOTD TR 644. The International Roughness Index (IRI) after laydown shall be equal to or less than the original index. Any new highpoints in excess of 0.3 inch in 25 feet (7.5 mm in 7.5 m) or less shall be corrected by diamond grinding. In the event that the final IRI exceeds the original IRI the contractor shall correct the finished surface as directed by the engineer.

Measurements: The Open Graded Friction Course, which includes the polymer modified emulsion tack coat material and the Open Graded Friction Course, will be measured by the ton (Mg) in place.

For acceptance and material disposition, a lot is defined as one day's production. The engineer shall measure and report, by the gallon (L), the quantities of polymer modified emulsion tack coat material used. The weights (mass) of asphalt mixture used shall be reported by the ton (Mg). Other additives shall be measured and reported by the contractor and presented to the engineer for permanent record.

Payment: The Open Graded Friction Course will be paid for by the ton (Mg) placed and accepted. Payment will be subject to the payment adjustment schedules contained herein below. Payment adjustments will be assessed on a per lot basis. The percent payment for the lot will be the lowest value of the six payment adjustment parameters shown in Table 2.

Table 2
Payment Adjustment Schedules

Plant:	Percent of Contract Unit Price per Lot		
	100%	95%	90% or Remove
Theoretical Maximum Specific Gravity (G_{mm}) Deviation from JMF Target	Less than 0.017	0.017-0.025	Greater than 0.025
JMF Sieve Tolerance Limits on Extracted Aggregate.			
No. 4 (4.75 mm) Sieve	±4.0	± (4.1-6.0)	± 6.1+
No. 8 (2.36 mm) Sieve	±3.0	± (3.1-5.0)	± 5.1+
No. 200 (75 µm) Sieve	±1.5	± (1.6-2.5)	± 2.6+
Roadway:			
Polymer Modified Emulsion Tack Coat Application Rate, gallon/sq yd (L/sq m)	0.08+ (0.36+) JMF Target	0.07-0.05 (0.32 – 0.23)	0.04- (0.18-)
Polymer Modified Emulsion Tack Coat Material Physical Properties[1]	---	---	---

[1]Payment adjustment for polymer modified emulsion tack coat will be in accordance with the supplemental specifications, Section 1002, Table 1002-5 "Emulsified Polymerized Asphalt (CRS-2P)[1]"(10/01).

Payment will be made at the contract unit price under:

Item S-004, Open Graded Friction Course (Low Volume Traffic Applications), per ton (Mg).

ITEM S-101, RETROREFLECTIVE SHEETING PANELS: This item consists of installing aluminum signs with Type III retroreflective adhesive sheeting on the exterior piles of bents as shown on the plan details. Aluminum panels shall conform to ASTM B-209 and retroreflective sheeting shall conform to Section 1015 of the 2006 Standard Specifications and the Supplemental Specifications thereto, and as directed by the engineer.

Payment for the retroreflective sheeting panels will be made at the contract unit price per lump sum, which all labor, materials, tools and equipment necessary to complete the item of work.

Payment will be made under:

Item S-101, Retroreflective Sheeting Panels, per lump sum.

CONTRACT TIME: The contractor will be allowed twenty-five (25) calendar days to complete the clearing and grubbing of the "Utility Clearing Corridor" as required in the special provision entitled **"INCENTIVE-DISINCENTIVE TO BUILD EXPEDITIOUSLY"** contained elsewhere herein. After the completion of the clearing and grubbing, the entire contract shall be completed in all details and ready for final acceptance in accordance with Subsection 105.17(b) within the time specified by the contractor, which shall not exceed the maximum allowable contract time stated on the "Contract Time" form contained elsewhere herein which shall also begin on the day of the Notice to Proceed.

Prior to assessment of contract time, the contractor will be allowed 30 calendar days from the date stipulated in the Notice to Proceed to commence with portions of the contract work including but not limited to assembly periods, preparatory work for materials fabrications such as test piles, or other activities which hinder progress in the beginning stages of construction. Prior to issuance of the Notice to Proceed, the Department will consider extending the assembly period, upon written request from the contractor justifying the need for additional time.

The contractor shall be responsible for maintenance of traffic from the beginning of the assembly period. During the assembly period, the contractor will be allowed to do patching and other maintenance work necessary to maintain the roadway with no time charges when approved by the engineer.

If the contractor begins regular construction operations prior to expiration of the assembly period, the assessment of contract time will commence at the time construction operations are begun.

The contractor is directed to the special provisions and the plans for any restrictions that may affect work schedules.

LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
SUPPLEMENTAL SPECIFICATIONS
(FOR 2006 STANDARD SPECIFICATIONS)

TABLE OF CONTENTS

LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
SUPPLEMENTAL SPECIFICATIONS

The 2006 Louisiana Standard Specifications for Roads and Bridges and supplemental specifications thereto are amended as follows.

SECTION 108 – PROSECUTION AND PROGRESS:

Subsection 108.04 – Prosecution of Work (03/05) Pages 74 and 75.

Add the following sentence to the third paragraph of Heading (b).

Should the surety or the Department take over prosecution of the work, the contractor shall remain disqualified for a period of one year from the completion of the project, unless debarment proceedings are instituted.

When the Department of Transportation and Development is not the contracting agency on the project, the second paragraph under Heading (c) is deleted.

SECTION 202 – REMOVING OR RELOCATING STRUCTURES AND OBSTRUCTIONS:

Subsection 202.06 – Plugging or Relocating Existing Water Wells (03/04), Page 105.

Delete the first sentence and substitute the following.

All abandoned wells shall be plugged and sealed at the locations shown on the plans, or as directed by the engineer, in accordance with the "Water Well Rules, Regulations, and Standards, State of Louisiana." This document is available at the Department of Transportation and Development, Water Resources Section, P. O. Box 94245, Baton Rouge, Louisiana 70804-9245. The Water Resource Section's telephone number is (225) 274-4172.

SECTION 302 – CLASS II BASE COURSE:

Subsection 302.05 – Mixing (08/06), Pages 152 and 153.

Delete the first sentence of Subheading (b)(1), In-Place Mixing, and substitute the following.

In-place mixing shall conform to Heading (a)(1) except that the percentage of Type I portland cement required will be 6 percent by volume.

SECTION 502 – SUPERPAVE ASPHALTIC CONCRETE MIXTURES:

Subsection 502.02 – Materials (08/06), Pages 210 – 213.

Delete Table 502-3, Aggregate Friction Rating under Subheading (c)(1) and substitute the following.

Table 502-3
Aggregate Friction Rating

Friction Rating	Allowable Usage
I	All mixtures
II	All mixtures
III	All mixtures, except travel lane wearing courses with plan ADT greater than 7000[1]
IV	All mixtures, except travel lane wearing courses[2]

[1] When plan current average daily traffic (ADT) is greater than 7000, blending of Friction Rating III aggregates and Friction Rating I and/or II aggregates will be allowed for travel lane wearing courses at the following percentages. At least 30 percent by weight (mass) of the total aggregates shall have a Friction Rating of I, or at least 50 percent by weight (mass) of the total aggregate shall have a Friction Rating of II. The frictional aggregates used to obtain the required percentages shall not have more than 10 percent passing the No. 8 (2.36 mm) sieve.

[2] When the average daily traffic (ADT) is less than 2500, blending of Friction Rating IV aggregates with Friction Rating I and/or II aggregates will be allowed for travel lane wearing courses at the following percentages. At least 50 percent by weight (mass) of the total aggregate in the mixture shall have a Friction Rating of I or II. The frictional aggregates used to obtain the required percentages shall not have more than 10 percent passing the No. 8 (2.36 mm) sieve.

SECTION 704 – GUARD RAIL:

Subsection 704.03 – General Construction Requirements (01/05), Pages 368 and 369.

Add the following to subparagraph (d), Guard Rail End Treatments.

All end treatments shall bear a label indicating the manufacturer and exact product name of the end treatment along with its assigned NCHRP 350 test level. This label shall resist weathering and shall be permanently affixed to the railing in such a way as to be readily visible.

SECTION 713 – TEMPORARY TRAFFIC CONTROL:

Subsection 713.06 – Pavement Markings (08/06), Pages 400 – 403.

Delete Table 713-1, Temporary Pavement Markings and substitute the following.

Table 713-1
Temporary Pavement Markings[1,2]

		Two-lane Highways	Undivided Multilane Highways	Divided Multilane Highways
SHORT TERM	ADT<1500; or ADT>1500 and time<3 days	Lane lines 4-foot (1.2 m) tape on 40-foot (12 m) centers; with "Do Not Pass" and "Pass With Care" signs as required		
	ADT>1500; Time>3 days and<2 weeks	Lane lines 4-foot (1.2-m) tape on 40-foot (12-m) centers with no passing zone markings		
	All ADT's with time <2 weeks		Lane lines 4-foot (1.2m) tape on 40-foot (12 m) centers; double yellow centerline	Lane lines 4-foot (1.2 m) tape on 40-foot (12 m) centers
LONG TERM	All ADT's with time >2 weeks	Standard lane lines, no-passing zone markings, legends and symbols and when pavement width is 22 feet (6.7 m) or greater, edge lines	Standard lane lines, centerlines, edge lines, and legends and symbols	Standard lane lines, centerlines, edge lines, and legends and symbols.

[1]No-passing zones shall be delineated as indicated whenever a project is open to traffic.
[2]On all Asphaltic Surface Treatments that are open to traffic and used as a final wearing course or as an interlayer, temporary pavement markings (tabs) on 20-foot (6 m) centers shall be used, in lieu of the 4-foot (1.2 m) tape, on 40-foot (12 m) centers.

SECTION 901 – PORTLAND CEMENT CONCRETE:

Subsection 901.08 – Composition of Concrete (12/05), Pages 732 – 734.

Add the following to Heading (a).

The blended cement containing up to 50 percent of grade 100 or grade 120 ground granulated blast-furnace slag must be in compliance with Subsection 1001.04 for portland blast-furnace slag cement.

SECTION 1005 – JOINT MATERIALS FOR PAVEMENTS AND STRUCTURES:

Subsection 1005.04 – Combination Joint Former/Sealer (11/05), Pages 782 and 783.

Delete Heading (a) and substitute the following.

(a) Description: This joint former/sealer is intended for use in simultaneously forming and sealing a weakened plane in portland cement concrete pavements.

The material shall consist of an elastomeric strip permanently bonded either mechanically or chemically at the top of each of two rigid plastic side frames and covered with a removable plastic top cap. Side frames shall be of such configuration that when the sealer is inserted into plastic concrete and vibrated, a permanent bond forms between side frames and concrete.

Delete Heading (b)(1) and substitute the following.

(1) Elastomer: The elastomer strip portion of the material shall be manufactured from vulcanized elastomeric compound using polymerized chloroprene or thermoplastic vulcanizate as the base polymer, and shall comply with the following requirements:

Property	ASTM Test Method	Requirements	
		Polymerized Chloroprene	Thermoplastic Vulcanizate
Tensile Strength, kPa, Min.	D 412	12,400	7,400
Elongation at Break, % Min.	D 412	200	400
Hardness, Shore A	D 2240	65 ± 10	65 ± 10
Properties after Aging, 70 h @ 100°C	D 573		
Tensile Strength, % Loss, Max.		20	20
Elongation, % loss, Max.		25	25
Hardness, pts. increase, Max.		10	10
Ozone Resistance, 20% strain or bentloop, 300 pphm in air, 70 h @ 40°C	D 1149	no cracks	no cracks
Oil Swell, IRM 903, 70 h @ 100°C, wt change, % Max.	D 471	45	75

Delete Headings (b)(2) and (b)(3) and substitute the following:

(2) Bond of Elastomer to Plastic: The force required to shear the elastomer from the plastic shall be a minimum of 5.0 pounds per linear inch (90 g/mm) of sealer when tested in accordance with DOTD TR 636.

(3) Bond of Plastic to Cement Mortar: This bond will be evaluated and shall meet the following requirements:

The force required to separate the cement mortar from the plastic shall be a minimum of 5.0 pounds per linear inch (90 g/mm) of sealer when tested in accordance with DOTD TR 636.

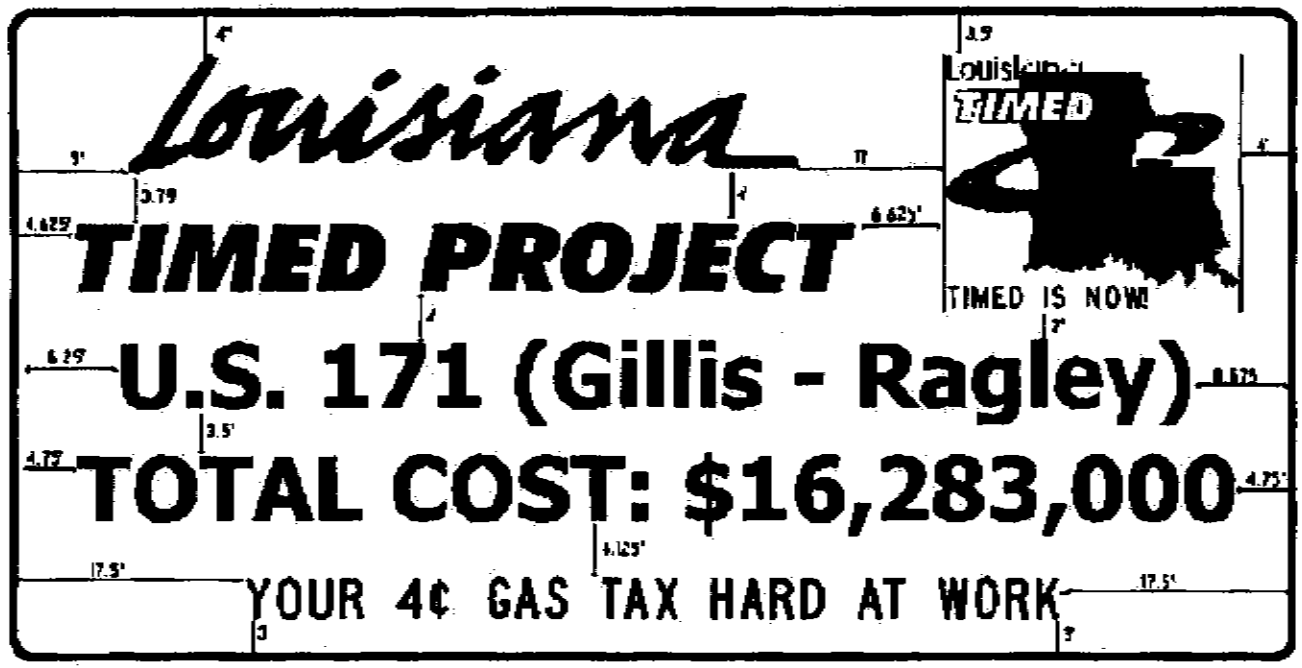
SECTION 1013 – METALS:

Subsection 1013.09 – Steel Piles (08/06) Page 822.

Delete the title and references to "Steel Piles" in this subsection and substitute "Steel H Piles".

FOR INFORMATION ONLY

48" X 96"
BACKGROUND BLUE
BORDER SILVER



LOUISIANA
9" YELLOW

4 3/4" Tahoma Bold
SILVER

3" Highway C
SILVER

LOUISIANA
1.75 Tahoma Bold
BLACK

TIMED
2.5 Futura Extra
Black Italic Bt
ORANGE WITH
BLACK AROUND IT

Program
1.75 ABD-BOC
BLACK

TIME IS NOW
1.5" D Compacta Bt
BLACK

La Shield
High 15 3/8
Wide 15 13/16
GREEN

TIMED
ORANGE
5" FUTURE EXTRA BLACK
CONDENSED ITALIC

SILVER SQUARE
22"X19"

ARROW
H 7.423
W 20.678

U.S. FOREST SERVICE
CONSTRUCTION STIPULATIONS AND REQUIREMENTS

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
DRY PRONG – WINN PARISH LINE
ROUTE US 167
GRANT AND WINN PARISHES

CONSTRUCTION STIPULATIONS

This Stipulation, made this 26th day of MAY, 2006 by and between the Louisiana Department of Transportation and Development, hereinafter referred to as the State, and the Forest Service, United States Department of Agriculture, acting herein by and through the Forest Supervisor, hereinafter referred to as the Forest Supervisor.

WHEREAS, the State is engaged in the laying out, construction, operation, and maintenance of a public highway designated as S.P. No. 023-03-0013, US 167, Dry Prong – Winn Parish Line, which traverses lands of the United States in the State of Louisiana, in Grant Parish, administered by the Forest Service, and

WHEREAS, the State and the Forest Supervisor desire to cooperate in the development and construction of a highway that will protect adequately and afford adequate utilization of the lands of the United States traversed by the highway for the purposes for which the lands are being administered.

NOW, THEREFORE, supplementary to the terms and conditions of the highway easement deed between the United States, acting through the Forest Supervisor and the State, the parties hereto agree to carry out the following provisions during the construction stage: (Construction stage is to begin when construction activities commence on lands administered by the Forest Service and end when the Forest Supervisor and the State mutually agree that any work done thereafter will be considered as maintenance, EXCEPT, that the Forest Supervisor reserves the right to reinstate the provisions of this stipulation if the State subsequently submits plans for reconstruction or alteration of the highway). Construction/reconstruction of the road shall be in accordance with the plans and specifications set forth in Exhibit A, attached hereto and made a part hereof.

The State (Grantee) shall:

1. Before any clearing of the right-of-way or construction of the highway commences:

   a. Prepare, in cooperation with the Forest Supervisor, a Fire Protection plan that sets forth in detail the fire prevention, presuppression, and suppression measures that will be taken by the Grantee, its employees, contractors, and subcontractors, and their employees in all operations during the construction stage. The fire plan shall be made available to all bidders prior to contract letting and the Grantee shall cause its contractors to comply with all provisions of the fire plan and of all burning permits issued for the disposal of flammable materials. Said Fire Protection Plan, attached, is hereby incorporated into this agreement.

   b. Prepare, in cooperation with the Forest Supervisor, a clearing plan that sets forth in detail the procedures and standards that will apply to (1) all clearing and disposal of merchantable timber and young growth in the right-of-way and (2) debris disposals, including debris removal from all streams. Such plan shall include provision for payment by the Grantee or its contractors for

the merchantable timber on lands of the United States to be cut, used, or destroyed in the construction of the highway or in clearing of said right-of-way. Payment for merchantable timber shall be at appraised value as determined by the Forest Supervisor: Provided, that the Forest Supervisor may dispose of the merchantable timber to other than the Grantee or its contractors at no stumpage cost to the Grantee or its contractors. Said Plan, attached, is hereby incorporated into this agreement.

c. Prepare, in cooperation with the Forest Supervisor, a Sedimentation Control Plan with the objective of protecting, restoring, or enhancing the roadside landscape, protecting soil, and protecting or reestablishing vegetative cover. Such plan shall, when appropriate, provide for vegetating cuts, fills, and other areas damaged as a result of highway construction; maintenance or operation; and for terraces, drainage, waste disposal areas, soil replacement, and other related requirements necessary to achieve the objective. Said Plan, attached, is hereby incorporated into this agreement.

2. Comply with the following recommendations of the State Fish and Game Department and Forest Service for wildlife and fish management:

a. Take all necessary precautions to avoid damage to fish habitat and exercise every reasonable precaution to prevent muddying or silting live streams.

b. Not deposit material removed from the roadway or channel changes in live streams or into the streams or stream channel where it would be washed away by high stream flows.

c. Not haul materials, including logs, brush, and debris by fording live streams, but shall provide temporary bridges or other structures for this purpose.

d. Not operate mechanized equipment in live streams, except as may be required to construct bridges, retaining walls, or channel changes as stipulated. All work in live streams will be coordinated with the Forest Service prior to undertaking. A minimum of 72 hours will be required for notification of the designated Forest Service representative.

e. Not allow oil or greasy substances originating from construction operations to enter or be placed where they may later enter a live stream.

3. The Forest Service may suspend all or any part of the construction/reconstruction activities and/or revoke or terminate this authorization without administrative proceedings upon breach of any of the conditions herein.

4. Prior to suspension, revocation, or termination, the Forest Service shall give the Holder written notice of the grounds for such action and reasonable time to cure any noncompliance. However, the Forest Service may require immediate temporary suspension of all or any part of the activities when the Forest Service determines it is necessary to protect the public health, safety, or the environment. If requested by the Holder, the superior to the officer ordering the

suspension, revocation, or termination shall arrange within 10 days of the request for an on-the-ground review of the conditions with the Holder. The superior shall affirm, modify, or cancel the temporary suspension as soon after the review as possible.

5. The Holder shall do everything reasonably within its power to prevent forest fires and shall not dispose of material by burning in open fires during the closed season established by law or regulation without a written permit from the Forest Service.

6. The Holder shall repair fully all damage to National Forest roads and trails caused by the Holder in exercise of the privileges granted.

7. The Holder shall be responsible for the prevention and control of soil erosion and gullying in the construction area and adjacent areas and shall take such preventative measures as are necessary to repair and revegetate damaged areas and to prevent future damage.

8. The Holder shall protect scenic and esthetic values in the construction area as far as possible.

9. Dispose of waste material resulting from slides during and after construction and surplus material at locations approved by the Forest Supervisor. A plan showing the proposed method of disposal shall be submitted by the Grantee at the time approval is requested.

10. Treat any sections of existing road, to be abandoned as a result of the proposed new construction, as designated by the Forest Supervisor, to restore them to their natural state. The necessary treatment shall be determined during a joint review between the Forest Service and the State and may include ripping of roadbed, removal of drainage structure, and opening drainage channels. Plans and specifications as mutually deemed appropriate to accomplish the objective shall become a part of this stipulation.

11. Build suitable access structures, grade separation, and/or connecting roads to standards that conform with the approved plans and specifications at the following locations:

Any existing or planned National Forest development (or other Forest Service controlled road) intersected or blocked by the right-of-way and

Any existing improvement or development of the United States or its permittees, such as campgrounds and picnic grounds, summer homes, hotels and resorts, and Government stations.

12. Repair or replace buildings, roads, trails, or other United States-owned improvements that are damaged or destroyed in the exercise of the rights granted herein at locations designated by and in accordance with plans and specifications approved by the Forest Supervisor.

13. Permanently monument the right-of-way in accordance with State requirements for such right-of-way before completing construction, but in any event, the minimum requirements shall be to place permanent monuments at the intersection of right-of-way with all property lines, section lines, and at intervals of not more than 1,000 feet along the right-of-way limits.

14. The Holder shall take reasonable precautions to protect all public land survey monuments and accessories, private property corners, and Forest boundary markers. In the event that any such land markers or monuments are damaged or destroyed, the Holder shall reestablish or reference the corner in accordance with directions and procedures to be furnished by the Forest Service.

15. A Performance Bond will be supplied by the State in the amount of $50,000 as a corporate surety, deposited securities, cash, irrevocable letter of credit, or assignment of savings account or certificate of deposit naming the U.S. Forest Service as payee. This bond will be held for the duration of the project and retired when the rehabilitation work by the Holder has been performed to the satisfaction of the Forest Officer in charge. The bond is available to the Forest Service as a means of paying for emergency remediation work in the event of a default of this Stipulation.

IN WITNESS WEREOF, the parties hereto have caused this Stipulation to be executed on the day and year first above written.

Louisiana Department of Transportation and Development

By: _____

Title: DOTD TIMED Program Manager

United States of America

By: _____

Forest Supervisor, Kisatchie National Forest

FIRE PROTECTION PLAN
(Reference Stipulation Item 1a)

The Louisiana Department of Transportation and Development (DOTD) shall:

1. Comply with Louisiana State Fire Laws.

2. Take all reasonable action to prevent and suppress forest fires.

3. Pay for the cost of suppressing a forest fire and damages to the Government caused by fire resulting from acts of DOTD or its contractors.

4. In the event the actions of DOTD or its contractors result in a fire on Forest Service property, and when/as requested by any forest officer, DOTD and its contractors will make manpower and equipment assigned to the project available for assistance to the Forest Service for emergency fire suppression.

5. Obtain the District Ranger's permission prior to any burning operation.

6. Take precautions before a fire is started. As stated in the stipulations for the Clearing Plan, only an air curtain destructor or other forced air technique within an approved above ground apparatus or a purposefully dug pit will be allowed. Burning will only be conducted in cleared areas where sufficient buffer exists to prevent fire from escaping from the site of the burn. DOTD will ensure that its contractors maintain sufficient manpower, equipment, and tools during burning operations to suppress a fire in the event it spreads or escapes.

7. In the event a fire escapes during a burning operation, DOTD or its contractors will immediately notify the District Ranger or the Kisatchie National Forest dispatch office at (318) 473-7152.

8. All internal or external combustion engines must be equipped with a spark arrester that meets the requirements established by the SAE Standard J335 or USDA Forest Service Specification 5100-1. The use of welding equipment, cutting torches, and similar heat-producing equipment will only be conducted in an area cleared of vegetation and not within one hour of the end of the day when personnel leave the jobsite.

CLEARING PLAN
(Reference Stipulation Item 1b)

The Forest Service will dispose of any and all merchantable timber that is cut from the National Forest lands within the required right-of-way for the project.

Unmerchantable material, including tops, branches, etc., shall be disposed of by the Louisiana Department of Transportation and Development as directed by the Forest Officer in Charge. Disposal may include any of the following methods or combination of methods:

- Hauling material to an approved landfill and/or other approved fill location*;
- Hauling material to a private site with proper landowner executed Certificate of Release and burning or burying the material on private property*;
- Grinding the material on site to a size acceptable to the Forest Officer in Charge and then incorporating the ground material in the topsoil layer; or
- Burning the material on site, in a pit, firebox or other appropriate container that minimizes the chance of fire spreading from the burn area, using an air curtain destructor or other forced air technique that will minimize the emission of smoke and embers.

*For the first two options DOTD may first shred the material on site before hauling.

DOTD will remove debris from all stream crossings, restoring them to original condition or equivalent.

EROSION/SEDIMENTATION CONTROL PLAN – SPECIAL PROJECT SPECIFICATIONS
(Reference Stipulation Item 1c)

Grantee shall take necessary measures to prevent and control soil erosion and sedimentation. The Grantee shall vegetate and maintain vegetation on all areas disturbed by construction, operation or maintenance of the road. All streams including minor drainage channels shall be protected from sedimentation.

To meet these objectives, the Grantee will accomplish the following provisions during and after construction. Provisions may be modified by the designated Forest Service District representative. The Grantee should communicate with the Forest Service representative about any adjustments or modifications.

U.S. Forest Service representative:

Name Bruce Prudhomme Phone 318-473-7209 E-mail bprudhomme@fs.fed.us

Louisiana Department of Transportation and Development representative:

Name John Gagnard Phone 318-561-5103 E-mail johngagnard@dotd.louisiana.gov

1. Grantee shall meet all requirements of applicable laws and regulations including the Natural and Scenic Rivers Act and all State Natural and Scenic Rivers permits and clearances, regulations and permit conditions of sections 401, 402 and 404 of the Clean Water Act and State water quality certification and requirements of the State Source Water Protection Program.

   State Natural and Scenic Stream Watersheds: Big Creek

   Source water protection watersheds: Big Creek

   U.S. Army Corps of Engineers Section 404 permit: ASJ-MVK-2004-494

2. Cut banks shall be sloped so they will not be steeper than 2:1 slope and so that they are sufficiently flat and stable to support vegetation. Tops of banks shall be rounded.

3. Earth fill slopes shall be no steeper than 2:1 slope to prevent sloughing.

4. Cut and fill slopes shall be maintained in a uniform fashion, particularly at the toe of slopes.

5. Grading on the area, other than to correct emergency conditions, will be avoided during wet periods, especially wet periods between January 1 and March 1, when runoff would cause erosion and sedimentation.

6. During grading operations, drains will be maintained to prevent washing of loose materials onto adjacent land or streams. Special care will be taken to prevent

placing loose soil near drainages to prevent soil from washing into stream channels.

7. Erosion, rills and gullies that develop within in the project area will be promptly repaired.

8. After grading is completed Grantee will place reinforced ditch liners where needed, as determined by a joint Forest Service-State survey.

9. Abandoned woods roads and other sources of concentrated runoff water shall have water bars or other drainage devices as necessary to prevent concentrated water from running over face of cut bank.

10. Install culverts on natural slope. Have water spill onto stable material to prevent cutting.

11. Water velocity control: rip-rap, waterbars, flat or v-bottom ditches, or whatever means necessary will be used to diminish the velocity of concentrated water flows along the project, including those in ditches and from culverts.

12. Erosion, sediment and water pollution control measures including temporary seeding and mulching, baled hay, silt fences and silt basins will be installed immediately after soil disturbance. The emphasis will be on preventing erosion rather than post-erosion treatment. Temporary seeding will be done if permanent seeding cannot be accomplished between Feb 15 and July 31. Except for those areas needed for access, areas where soil has been disturbed shall be protected by mulching, seeding and mulching, erosion control blankets or similar treatments within 30 days.

13. Permanent erosion/sediment control structures and measures must be promptly installed according to appropriate LaDOTD or Forest Service requirements. (USDA Forest Service Specifications for Construction of Roads and Minor Drainage Structures, EM-7720-100R.) All ditches and other places subject to concentrated water flow shall be protected, as soon as possible, from soil erosion by solid sodding, concrete ditch liners or other measures as needed. During construction, the Forest Service, LaDOTD and DEQ may all provide remediation suggestions based on monitoring results.

14. Permanent restoration measures should begin as soon as possible after construction/disturbance occurs. Vegetative cover should be established as soon as possible so that the amount of soil exposed at one time will be minimized. Establish and maintain a vegetative cover on all areas disturbed by this project according to the attached guidelines: RESTORATION OF DISTURBED AREAS. Methods and seed mixtures that are more effective in rapidly establishing a complete vegetative cover may be substituted for those in the guidelines. All seed mixtures must be approved by the Forest Service.

15. Restoration will be considered completed not earlier than one year following the successful establishment of vegetative cover. Vegetative cover over at least 80 percent of the entire disturbed area will be considered successful establishment. No erosion or significant soil movement or sedimentation of streams should be

occurring. To ensure that funds are available to restore the project right-of-way to a state acceptable to the Forest Service, Grantee will require that it's contractor obtain a performance bond in the amount of $50,000, payable to the Forest Service, which will be used by the Forest Service, if necessary and after consultation with Grantee, to fund measures it determines are necessary to achieve permanent stabilization of the project right-of-way.

16. It is the responsibility of the Grantee to continue to construct and maintain erosion/sediment control structures and establish and maintain a permanent vegetative cover on all disturbed areas where bare mineral soil is exposed for the life of the project.

17. Constant and ongoing coordination between the Forest Service and Grantee will be required to successfully implement the erosion and sedimentation control measures addressed in this plan, and such coordination will require inspections and consultations on the part of the Forest Service. $10,000 per segment shall be deposited to an account maintained by the Forest Service for the purpose of compensating monitoring costs. Unused funds shall be reimbursed to LaDOTD upon completion of the project. Monitoring performed by the Forest Service shall not exceed $10,000 per project segment.

18. The contractor will keep on site or readily available sufficient erosion control materials to meet current needs as well as anticipated needs if major rainfall/storm events are predicted or occur.

19. If major rainfall/storm events (greater than 2+ inches in 24 hours) are predicted, a field review of the current erosion control measures will be conducted by the contractor. Any needed maintenance or additional erosion control measures will be implemented prior to the storm, and prior to any potential cessation of work on the project.

20. Sediment catchments will be installed along drainage channels, at cross drain inlets, and at storm sewer inlets as early as practical, and prior to grading, and be maintained for effectiveness throughout the construction process.

RESTORATION OF DISTURBED AREAS

Seeding & Mulching

This work shall consist of preparing seed beds, furnishing and placing required seed, fertilizer, limestone, mulch and net/blanket material to establish and maintain a vegetative cover on all areas disturbed by this project according to the following guidelines. These guidelines may be modified according to the results of soil testing.

1. Seedbed Preparation – After returning the site to its original contour and constructing needed erosion control structures, rip heavily compacted areas as necessary. Fertilize and lime. Disk the area to a minimum of 6 inches of depth and sow the recommended seed mixture (Seeding Guidelines for Erosion Control) on the freshly prepared soil bed.

2. Fertilizer and Lime Rates – Fertilize all disturbed areas at the following rates:

   - Lime – 3 tons/acre
   - Use ground limestone with a neutralizing value of 90-100 percent
   - Fertilizer – 700 pounds/acre

   Chemical Analysis of fertilizer:

% Nitrogen	% Phosphoric Acid	% Potash
8	24	24

3. Seed species; Rate; and Seasons – Use mixtures of at least two (2) grasses and one (1) legume as indicated in attached specifications and as directed by the Forest Service representative. These are minimum rates. Heavier rates can be used. It is always cheaper to plant more seed than to have to replant.

   If seed is broadcasted cover seed lightly by dragging the area with a cultipacker or wire mesh dragnet chain.

4. Mulching – The use of hay, straw, or commercial mulch will be necessary when slopes exceed 5 percent, on sandy soils or during dry periods (normally June 15 thru Oct 1). Area will be covered with 2-½ tons (80 bales/acre) of mulch. Mulch should be tied down with woven nets, asphalt tackifier, synthetics. Erosion control blankets will be used on cut or fill slopes, which cannot be shaped to a 3:1 gradient or less.

5. Materials may be placed by the Hydraulic or Dry Method:

   - Hydraulic Method (Hydromulch) wood cellulose or grass straw fiber mulch and fertilizer may be applied in one operation by means of hydraulic equipment that uses water as the carrying agent. A continuous agitator action that keeps the materials in uniform suspension must be maintained throughout the distribution cycle. The discharge line shall provide an even distribution of the solution to the seedbed. Mulching shall not be done in the presence of free surface water. Applications shall start at the top of the slope and work downward. If necessary the use of extension hoses may be necessary to reach the extremities of the slope.

   - Dry Method Mulch shall be applied after the seeding and fertilizing are complete. The mulch shall be applied uniformly at the rate specified.

   When a binder is to be used for mulch, the material shall be applied at the specified rate and immediately distributed evenly over the mulch. The applicator shall prevent asphalt adhesive materials from marking or defacing structures, appurtenances, pavements, utilities or plant growth.

   Installation of Netting & Erosion Control Blankets. Netting & Erosion Control Blankets shall be installed where necessary in accordance with the manufactures recommendations.

6. Care During Construction: The contractor shall be responsible for protecting and caring for seeded areas until final acceptance of the project. Repair all damage to seeded areas caused by construction operations.

Maintenance will include the following:

(1) Fertilize areas with sparse vegetation.

(2) Repair all structural failures to erosion/sediment control structures.

(3) Construct additional erosion/sediment control structures at locations where erosion or sedimentation is occurring.

(4) Site prepare, reseed, fertilize and mulch bare soil area or areas with insufficient vegetative cover. Reseeding will be done between April 1 and June 30.

(5) Additional maintenance will be required by the Forest Service as needed.

Seeding Guidelines for Erosion Control

Permanent Seeding:

March – July*

	lbs(pls)/ac
Pensacola Bahia *(1)*	50
Bermuda Grass (hulled)	15
Browntop millet	20
**Lespedeza – Aulotan, Kobe Common (scarified) *(2)*	6

September – February

(Seeding during this period will be Temporary Seeding and will be followed by permanent seeding at the appropriate time)

	lbs(pls)/ac
Rye *(1)*	40
Wheat	30
Clover *(2)*	20

(1) Best grass for erosion control
(2) Inoculate all legume seed with the appropriate inoculants.
*Every effort should be made to seed between March and June – spring planting is the most effective

**Never use the following species of *Lespedeza* for revegetation on KNF land (nomenclature as retrieved on 2/24/06, from the Integrated Taxonomic Information System (IT IS) database; http://www.it is.usda.gov.

1. *Lespedeza cuneata* (Dum.-Cours.) G.Don; Recognized synonyms: Lespedeza juncea var. sericea (Forbes and Hemsley), and Lespedeza sericia (Miq.)

2. *Lespedeza bicolor* (Turez.)

Louisiana

Department of Transportation And Development

Traffic Control Standard

Number 18A

Revised

April 10, 2003

FOR INFORMATION ONLY

Traffic Control Standard #18A
TRAFFIC SIGNAL CONTROL SYSTEM
Revised April 10, 2003

1.0 INTRODUCTION

This specification sets forth the minimum requirements for a shelf-mounted, digital, solid-state traffic control system including and to be furnished with time-based coordination, closed-loop system communication/coordination, multiple railroad/fire preemption sequences, and hardwired/telemetry interconnect capable of operating as both a master and secondary. All components needed to operate as both a master and secondary shall be provided for in each assembly. The system design shall be based on the requirements of NEMA Standards Publication No. TS-2, 1998. Controller sequencing referenced in this standard for diamond intersections emulates the design and standards from the Texas Department of Highways and the Texas Transportation Institute. The controller should have a database that conforms to section 3.5 of the current NEMA NTCIP specifications

All components and accessories shall comply with the NEMA testing requirements and a certification of compliance shall be presented with each bid for that equipment being offered. The operational requirements herein extend the requirement of NEMA controllers and supersede NEMA TS-2 where differences occur.

All equipment and operational characteristics specified herein shall be provided, except where noted.

2.0 CLOSED-LOOP COMPUTER OPERATING SYSTEM

The closed-loop central operating system shall be a traffic management program for hard-disk supported IBM personal computers and compatible equipment which creates a system network using the principle system components. The software shall operate using Microsoft's Windows operating system. The software shall be programmed resident for the operating system.

2.1 SOFTWARE DESCRIPTION

The software shall be loaded into the specified personal computer and operationally verified by the supplier. Back-up software shall be supplied on a compact disk.

The software shall be licensed to the agency for its use on a single computer or each computer specified in the system. Software improvements and enhancements to the supplied version shall be furnished to this agency at no additional cost. Software is supplied when indicated on the plans for a state job and will be specific to a highway district.

Programming displays, on the PC screen, shall aid the operator in entering data from the PC keyboard. These displays shall be arranged in using a tool bar format. The main tool bar shall allow the user to select a major function. A sub-tool bar shall be allowed for selection of a specific area within that function when it exists.

The central computer software shall provide rapid movement through menus, sub-menus and data base pages and limited only by the operating speed of the computer. Returning to the main menu or sub-menu shall be selected by pressing a single key.

Menus and sub-menus shall not contain mnemonics or codes for descriptions. Additional screens shall be provided where necessary to explain keyboard procedure. All icons that are defined within a tool bar shall be described in a help line as the cursor is placed over that icon.

Traffic engineering terminology shall be used throughout the programming displays. Display organization and data entry approach shall allow system operators to program the central computer without using reference cards or manuals.

2.2 SOFTWARE FEATURES

Once the computer power-up routine is complete, the system shall be in monitor mode. It shall be possible for the operator to exit this mode and enter the user mode, and vice-versa.

In monitor mode, central computer shall continue to monitor events even if the printer is off-line. Upon restoration of the printer, it shall print a hard-copy of events occurring prior to and during printer off-line.

Central computer software shall provide:

a. Dynamic Displays
b. System Printouts
c. Data Base Management
d. Security
e. Directories
f. Data Back-up

2.3 DYNAMIC DISPLAYS

Central computer shall display the following in real-time color graphics selected from the menus:

a. Intersection Display
b. System Map Display

All text data shall be displayed in traffic engineering terms. Mnemonics shall be acceptable; however, the need for reference guides and manuals shall not be acceptable. All information shall be simultaneously and continuously displayed until canceled by the operator. Displays shall not affect system on-street operation. The displays shall have a minimum one second resolution.

2.3.1 Intersection Display

The central computer shall display the operation of any selected intersection controller within any selected system.

Each display shall be user-created to indicate the intersection configuration, including any "T" and standard diamonds, on a single screen display. The intersection display shall show as a minimum:

a. Intersection configuration layout for all possible phasing of intersection controllers including overlaps.
b. All vehicle signal indications, (R,Y,G) for each active phase.
c. All pedestrian signal indications: walk, flashing and solid don't walk, for all 16 active phases.

d. Vehicle and pedestrian detector actuation for each displayed phase.
e. Cycle, offset, split or plan in effect.
f. Arterial master and intersection controller identifier numbers, including intersection street names.
g. Central computer and local intersection controller TOD clocks.

The display shall include dynamic statuses of the arterial master and the intersection controller. Arterial master status shall consist of operational status, cycle, offset, split, plan in effect, cycle length, cycle countdown, and status of special functions. System control mode status shall include manual, external, time-of-day, or traffic responsive operation. This status shall indicate whether the system is operating under plan, time-base coordination, or time-base backup.

Intersection controller dynamic data shall consist of operational status; non-interconnected coordination, coordination offset value, or free/plan indicator; split values based on cycle and split in effect; preemption status; and diagnostic indications. Operational status shall include on-line, off-line, failed, or disabled. If the intersection controller is off-line or failed, the conditions causing that failure shall be also displayed. All diagnostic indications having alarm status shall be shown flashing. Alarms, preempt call numbers, and preemptor in effect shall also be shown. If preempt is in a flashing operation, it shall be displayed as flashing.

2.3.2 System Map Display

System Map Display shall provide geometric layout of the system for a minimum of 32 intersections simultaneously and show real time display. The display shall also indicate the relative placements for a minimum of sixteen system detectors. Any intersection shall be selected to present a full screen display as stated the section 2.3.1.

A map editor shall permit the user to lay-out the intersections in their relative physical relationship to each other, place the system detectors anywhere along the approaches, and number the intersections appropriately. Five-legged intersections, central business district layouts (CBD), and angled approaches shall be possible.

A text editor shall permit the user to create a minimum of 50 20-character strings and place them on the display. This feature shall allow labeling streets, detector identification, or other points-of-interest. All text would preferably be placed at any angle on the screen. For instance, street names shall follow the angle of the drawn street (horizontal, vertical, or diagonally), if desired.

Display data shall include current system operating parameters, special function status, cycle countdown, zone control mode of operation, and consolidated intersection status.

Consolidated intersection status shall indicate if an intersection is on-line, free, has a coordination fault, is in preemption or flash, or has a communication failure.

2.4 SYSTEM PRINTOUTS

System printouts present system readiness and operational status and are used for analyzing system performance. The printouts shall be divided into four categories: Computer Events, Event Reports, Status Reports, and Logs, as detailed in this specification.

2.4.1 Computer Events

The central computer shall provide a monitor mode of operation to receive status change and operating failure event reports from any arterial master or isolated controllers.

Events shall be switchable for display on the central computer terminal or printed as a hard copy when they are received. Events shall consist of system identification, time and date of event occurrence, device identification (if device diagnostic event), and event description.

The central computer shall store events in a hard disk file to produce event reports, as needed. It shall be possible to transfer event files to a storage diskette for historical record keeping. Event files shall be removed from hard disk after file transfer to storage diskette to prevent overflowing the hard disk.

2.4.2 Event Reports

Event report capability shall be provided for events occurring on one day or group of days from central computer files on the hard disk or storage diskette.

A directory search capability shall be provided that lists all event files for any system by date, on the selected disk drive. If one day is selected, the date shall be entered directly or by directory search. Directory search shall be used to select dates for event reports for a group of days.

It shall be possible to display and print events as received or sorted by event type. If event type selected is for a system device, it shall be possible to specify all devices or a single device.

Menus shall be provided to facilitate event type selection. Program operation shall allow interactive operation for preparing an event report for any combination of event type and system device.

2.4.3 Status Reports

Status reports shall be generated by the arterial master controller in response to a manual command by the operator at the central computer. These reports shall present an immediate record of system operational status on the central computer display. Provision shall be made for hard copy printout.

2.4.4 Logs

Detector data shall be processed by the central computer. Real-time logs shall be printed as received by the central computer while in the monitor mode. System detector logs shall be scheduled, formatted, and sent from the arterial master.

2.5 DATA BASE MANAGEMENT

2.5.1 Programming Displays

A data base management program shall exchange and update data with arterial master and intersection controller. Each arterial master and intersection controller shall have separate data base programming pages. These pages shall contain all the programming options unique to each controller type.

Once data base management is selected from the main menu, a sub-menu shall be presented listing the data base pages available for programming. It shall be possible for the user to scroll through the data

pages of a sub-menu or enter and exit a data page without waiting for data to fill the page. For example, page up and page down functions shall permit the operator to go from page 1 to 30, within 5 seconds.

All programming entries shall primarily consist of numerical values, YES/NO or ON/OFF entries. During program entry, the new data shall over-write the old data. If the data is in error, changes shall not be permitted and the user shall be alerted by either an error message on the display or a warning tone.

2.5.2 Upload/Download

All devices shall use upload/download techniques for data base programming. The arterial master shall employ an additional data base programming method through direct data entry.

Upload/download shall transfer the entire programmable data base from/to the arterial master or any intersection controller via the arterial master, with the exception of intersection controller preemptor and overlap configuration.

All upload/download data shall use block transfer techniques, and shall be verified by block check-sum and word parity. Non-verified data shall cause termination of the upload/download with no data transfer taking place. It shall not be possible to load erroneous interval and configuration information to the controller.

Upload techniques shall not cause the system or intersection controller to go off-line. Traffic control operation shall remain intact in all respects.

The program shall compare the database of any arterial master or intersection controller to the database on file following an upload. The compare function shall be executed by simple keyboard technique and shall identify any differences between loaded and file data. The system operator shall be able to correct, use, or substitute data values, and proceed with further comparison.

2.5.3 Backup Data Base

Data from the backup files shall be read and verified for programming EEPROMs to be installed in intersection controllers and arterial masters.

2.5.4 Auto Print

Selection to automatically print any or all arterial master or intersection controller data bases that are stored in the central computer shall be provided.

Selection eliminating intersection controllers which are not in service when all intersection controllers are selected for printing shall be provided.

The system shall print only pages within a data base that contain data. Pages with no user-entered data shall be skipped. If a data base is selected for printing, but is not found on the central computer hard disk, it shall be noted on a separate sheet of the printout.

2.6 SECURITY

System security at the central computer shall be ensured through three levels of access. The levels shall be as follows:

a. Supervisor
b. Data change
c. Viewer

The supervisor and data change levels shall have separate access codes that must be entered prior to making data base changes.

The supervisor level shall permit access code number assignments and data base changes. Data change level shall permit data base changes. If an incorrect code is entered, data base changes are denied. Viewer level shall not permit any data base changes.

2.7 DIRECTORIES

System and intersection directories shall include location of arterial masters and associated intersection controllers by name or number.

System directory text shall describe each of the systems. A system name may be entered and shall identify the system in menus, report titles, and arterial master data base pages.

Intersection directory text shall list intersection names and telephone numbers for each associated arterial master. An intersection name may be entered and shall identify the intersection in menus, intersection displays, and intersection data base pages.

The user shall assign names to the intersection controller alarm inputs. These names shall identify alarms in event reports. Each alarm name shall be twenty characters.

2.8 DATA BASE BACKUP AND RESTORE

The system shall include an option for making backup copies on diskettes of the data base files contained in the central computer. All files required to restore the system to operation without the need to re-enter data shall be included on the backup diskette.

The central computer's files containing records of event and buffeted data shall be saved on hard disk when received from the arterial master. Provision for transferring computer files to storage diskettes shall be included. After transfer to storage diskette, monitor files shall be removed from the hard disk by a user selected command. Storage diskette files shall allow for data analysis by the same report programs used for files on hard disk.

2.9 SOFTWARE MAINTENANCE AGREEMENTS

The software agreement for licensing to the Department shall be in force upon the acceptance by the vendor to supply equipment and software to the Department either by purchase order or construction project.

2.9.1 Performance

The vendor shall warrant that the software will perform according to the specifications.

2.9.2 CPU Limitations

The vendor shall agree that it will be the Department's option to use the software on upgraded equipment at any time and use the software on backup equipment for a limited time. The limits of use shall be as previously stated.

2.9.3 Backup Provisions

The vendor shall agree that the Department will utilize off-site storage for the software and backup files. Copies of these files shall be made by the Department as needed within the operational guidelines previously stated.

2.9.4 Operational Restrictions

The vendor shall agree that the Department will utilize the software to monitor any system within the Department's responsibility.

2.9.5 Maintenance Standards

The vendor shall agree to supply the Department with updates to the software. If the updates require upgrading of the Department's equipment, the vendor will provide the source codes to the Department for the version of software provided to the Department.

2.9.6 Source Code

The vendor shall deliver the source code and documentation to the Department to be used in the event of failure to provide support to the software. A viable holding arrangement will be considered as an alternate method for source code to be delivered to the Department at no cost to the Department. This option shall be stated on the order, plans, or other purchase agreements for the controllers, otherwise will not be required.

3.0 SYSTEM COMMUNICATIONS

The controller unit shall communicate with a system master controller, central computer (for isolated intersections), or portable computer connected directly to the controller. Internal settings, including coordination, shall be accessible via an external Hayes compatible modem through the RS-232 interface. The controller unit shall receive system master commands and data transmissions. In addition, it shall transmit the controller unit status, database, and system detector information to the system master. All alarms provided shall be accessible through the RS-232 port by remote interrogation and by automatic dialing initiated by the controller unit.

3.1 SYSTEM COMMANDS

The communication shall allow the controller unit to receive, as a minimum, the following commands:

a. The coordination pattern (selects the Cycle, offset, and split)
b. Time of day and date
c. Special function commands (minimum of four)
d. Free and flash mode command patterns
e. Control of the local system on a specified master controller
f. Request for local status

3.2 STATUS DATA

The status of each of the following functions shall be transmitted from each controller in response to a status request from any monitoring device:

a. Green and yellow status for all phases and overlaps
b. Walk and pedestrian clearance status for all phases
c. Vehicle and pedestrian detector status (8 pedestrian and 64 vehicle detectors)
d. Phase termination status
e. Local Cycle time
f. Coordination status
g. Conflict flash status
h. Local flash status
i. Preempt activity and calls
j. Volume and occupancy data from a minimum of 16 system detectors
k. Status of four user-defined alarms
l. Zone map display data

3.3 UPLOAD/DOWNLOAD

The communication shall provide the capability to upload/download the entire intersection data base to/from a monitoring personal computer. When desired, only a single screen of data can be sent and received from the intersection

3.4 OPERATION

Communication shall operate from communication ports on the front of the controller. The controller unit shall communicate with a system master/secondary controller, central computer, portable computer and/or the conflict monitor with RS-232 serial ports accessible through DB-25S connectors. The reserve connector pin assignments shall be as follows:

Pin #	Designation
1	Frame Ground
2	Transmit Data
3	Receive Data
4	Request to Send
5	Clear to Send
6	Data Set Ready
7	Signal Ground
8	Data Carrier Detect
20	Data Terminal Ready
22	Ring Indicator

The baud rate of each port shall be keyboard selectable for any one of the following rates: 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 28.8K, 33K, and 57.6K. The port shall be configured for an eight (8) bit word, one (1) start, one (1) stop bit and no parity.

The communication path shall use a twisted pair of wires. These may be leased lines (Type 3002, voice grade, unconditioned), radio modem, or dedicated cable.

Communication timers shall be programmable from 0 to 9.9 seconds.

The controller unit shall be programmable via keyboard with a user assigned, unique address identifying the master and intersection.

3.5 INTRA-SYSTEM COMMUNICATIONS

Intra-system communication shall be achieved through one of the four RS-232 serial ports defined herein and an external modem. The modem shall not be provided with order unless specified elsewhere.

3.6 RADIO SYSTEM COMMUNICATION (Inter-system) - (WHEN SPECIFIED)

The data radio modem system is for microprocessor based control equipment. The modem is external to any other equipment in the controller cabinet and at the terminus and shall be provided for data transmission and indicated on the plans. The modem shall provide half or full duplex communications. The modem shall connect directly to the controller in accordance with these standards for the auto dial modem stated above.

The Department will provide the necessary management to obtain a study for interference on the above mentioned radio frequencies, coordinate the frequency to be used, and apply for licensing to use the frequency. The equipment shall operate at the assigned frequency and the supplier/contractor shall make the necessary adjustments for correct operation.

3.6.1 Radio Modem

The modem shall meet the environmental requirements of NEMA TS-2 TYPE 2 and be a maximum dimension of four inches high by twelve inches wide by twelve inches deep. Indicators shall be provided on the front of the modem indicating carrier detect, transmit data, and receive data. The following shall be the operating characteristic of the modem:

FUNCTION	CHARACTERISTIC
Frequency Range:	173 MHz or 940 MHz range (Capable of: 138-174 MHz, 406-430 MHz, 450-475 MHz, 928-960 MHz).
Temperature Range:	-30° to +60° C.
Operating Voltage:	120/240 VAC
Transmission Mode:	16F3, 16F9, 15F2
Modulation: (Receive and Transmit)	FSK, Frequencies, 2100 Hz - mark, 1300 Hz - space.
RF connector:	Type N Female
Data connector:	RS-232-C, 9-pin
Sensitivity:	-107 dbm (1.0μV) for BER_$1x10^{-3}$ over the voltage and temperature range.
Decoder type:	PLL FSK Demodulator
Carrier Attack Time:	_ 10mS
Turn Around Time:	10mS Maximum
Power Output:	2 watts extendable to 20 watts, 100% duty cycle.
Frequency Stability:	±5 ppm on all frequencies.
Harmonic Distortion:	5 % Maximum
Compliances:	FCC Part 15, EIA RS-316B, and RS-232-C, as applicable.

TABLE 18A-2
RADIO MODEM CHARACTERISTICS

3.6.2 Antenna

The antenna shall be connected to the modem by transmission cable meeting the Department standards. The antenna shall be a directional Yagi with a minimum of 9 Db gain and five elements. The mounting shall adapt to a one and one-half or two inch mount.

3.6.3 Antenna Tower

The contractor (for projects) shall provide a tower for mounting the antenna at the site as shown on the plans. The height of the tower shall be determined from the frequency coordination study. The tower shall be erected in accordance with the AASHTO standards.

3.6.4 Central Office Radio Terminal

Additional labor shall be provided by the project contractor to install the antenna on the Department's tower, the cable from the antenna to the modem, and the necessary hardware to complete the installation as designated on the plans and in accordance with good engineering practices. The radio modem and auto-dial modem shall be installed in a single 19 inch rack mounting system or on a wall mountable shelf.

Mounting equipment and hardware shall be provided by the contractor. The Department will supply one RJ-11C jack for the dial modem and the necessary 120 VAC outlet for the equipment adjacent to the installation as designated by the Department.

The installation shall include lightning protection on the incoming RF cable in accordance with good engineering practices.

3.6.5 Telephone Terminal Boards (For information purposes only)

The following equipment will be installed into the existing PBX equipment for telephone lines needed to implement the system communication. All other equipment specified shall work with this equipment to complete the system's communications. This equipment will be installed in and manufactured by Rolm Telecommunication Company.

TYPE EQUIPMENT	MODEL
16-channel coder	#8551E
16-channel decoder	#8552A
8 channel line interface	#85540A

TABLE 18A-3
TELEPHONE TERMINAL EQUIPMENT

This equipment will be installed by the Department and made ready for the completion of the system.

4.0 SYSTEM MASTER CAPABILITIES

4.1 DESIGN REQUIREMENTS

The system master shall be a microcomputer device that shall control and supervise a minimum system of twenty intersection controllers. It shall provide the communications link between the central computer and each of the intersection controllers within the system. The system master shall be assigned a unique identification number for communications on the same link with other system masters. An optional method for providing system master operation is to include the master operation as part of the software within the secondary controller. This option shall require the operation of the traffic signal control and system master without interference between them. Priority shall be given to the traffic signal control and operation as defined in this section.

Each master shall generate system commands to its associated intersection controllers, either in response to prevailing traffic conditions analyzed by system master using detectors information or by time-of-day scheduling, external command inputs, or manual inputs.

The central plans shall be constructed with the following minimum options:

a. 48 Patterns with a unique cycle length per pattern
b. From one to four offsets per pattern
c. Selection of one split per pattern from a table of 24 programmable splits
d. Selection of one sequence per pattern from a table of 16 programmable sequences.

e. Pattern 254 (NTCIP) causes the intersection to operate in free.
f. Pattern 255 (NTCIP) causes the intersection to flash as programmed internally

The reference point for all cycles shall be programmable by the user. Normally it is initialized to midnight.

A minimum of forty-eight patterns will be provided. Each pattern can make all the selections as defined as in section of 3.5 of the NTCIP NEMA protocol.

The system master shall monitor the operation of all the associated intersection controllers, communication paths, local detectors, and system detectors. User programmable reporting alarms shall initiate failure reports to the designated terminals from a list of user identification numbers. A minimum of four terminals shall be assignable.

System master shall provide:

a. Traffic Plan Selection
b. Crossing Arterial Synchronization
c. Diagnostics
d. Events
e. Logs
f. Reports
g. Data Entry

Alternative crossing arterial synchronization shall be accomplished by using the master synchronization reference point. The operating cycles having the same cycle length will be referenced to the same point. An additional interface method shall be used to operate both arteries on the same cycle length. Associated system control shall also be included for mutual coordination.

4.2 TRAFFIC PLAN SELECTION

The traffic plan shall be selected on a priority basis. The priority order shall begin with the highest being:

a. Manual commands
b. Central System commands
c. Time-of-day/day-of-week/week-of-year scheduled commands
d. Traffic responsive commands.

4.2.1 Traffic Responsive Operation

Traffic plans shall be automatically selected in response to real-time system detector input data. These commands shall be transmitted to, received and implemented by the intersection controllers within the master's system.

A minimum of forty-eight system detector inputs shall be provided and each, if selected, shall be processed into scaled values used for volume, density, and occupancy data. The volume and occupancy scale factors shall be user-specified and programmable through the keyboard into the master for each detector; otherwise a default value of zero shall be entered. Each detector shall be user-programmable as one of two directions or crossing direction.

Detector data shall be processed to provide a value representing traffic conditions for each function. The process shall include:

a. Data computations resulting in values accurately representing vehicle volume (vehicle/hour), occupancy (time detected), and density (vehicle/mile).

b. Comparison of computed values determining the relative volume and density for traffic conditions detected and assigned to directions as stated above.

c. Accumulation of detection values over a user programmable time interval, evenly divided into a minimum of ten sampling periods, shall provide smooth transitions into selected programs designed by the Department to progress traffic through the system. Functional requirement for this process is to select a cycle, offset, and split from user specified values of detector data.

d. User-specified adjustment factors for each function shall be used to make the detector data be within 50 to 100 percent of selected vehicle density characteristic.

Function values shall be compared to user-specified threshold values for traffic plan selection. Plan selections shall not oscillate between plans which have numerically close values. A method of hysteresis shall be used to prevent oscillation.

Ranges for six traffic volume and occupancy levels shall be programmable and used for comparing the master's computed volume and occupancy level from the overall detector data. Level one shall be associated with light traffic with no coordination and level six shall be associated with heavy traffic. Twelve programmable thresholds shall be provided for the master's comparison values to implement plan selection based upon its computed values.

Arterial directional preference shall be determined by computing directional detector data. The magnitude of the difference and directional preference shall be compared to user programmed threshold values to select and implement directional or average offsets.

Split selection shall be based on user assigned system or phase detector data. Programmable weighing of each detector data, as stated above, shall be used by the master for computing each detector adjusted data. The master shall implement the appropriate split by comparing the main street and cross street data. Programmable values shall be used for selecting four levels of increasing values and four levels of decreasing values. If an error condition is detected, the selection shall default to average or user specified value.

Based on the master's computed detector data levels, a user-specified traffic plan shall be selected as the traffic responsive plan. If computed level or computed offset cannot be determined because of detector failures, a default plan shall be implemented from TOD plan or from TBC.

Each traffic plan contains a programmed split command for that plan. Alternately, it shall be possible to select splits and special function commands for user-specified plans based on split demand function values. Four split/special function combinations shall be available.

4.2.2 Time-Of-Day/Day-Of-Week/Week-Of-Year Schedule

Time-of-day scheduling shall be controlled by an internal clock, accurate to the power line frequency. In the event of a power failure, the clock shall be maintained for a minimum of 72 hours. Leap year shall be automatically compensated for and daylight savings time shall be programmable for date of occurrence. A minimum of 24 user-defined programs shall operate on a daily, weekly, and yearly basis.

TOD programming shall follow section 3.5 of the NEMA NTCIP specifications.

Programmable entries shall include:

a. Day-program assignment
b. Start time
c. Traffic pattern (cycle, offset, split, special functions, free, plan command)
d. Traffic responsive plan enable
e. Traffic responsive plan override of TOD
f. Sample period interval
g. Sample period log interval
h. Detector log interval

The arterial master shall update time and date in all intersection controllers in a system a minimum of once every hour.

The arterial master shall include a time comparison feature. This feature shall indicate the need to update the master clock after being compared with the reference clock in the central personal computer. It would be preferred to enable a clock reset from the central computer to update the master clock with the time from the central computer.

4.2.3 External Commands

External commands shall be received from a remote source such as another arterial master. These control signals shall be used to initiate an external plan. Alternatively, the external command inputs shall be used for crossing arterial synchronization. External commands shall override TOD and traffic responsive operation.

4.2.4 Manual Entry

Manual entry from the front panel keyboard or a remote source shall provide the highest priority of plan selection. It shall be the default program if traffic responsive operation fails and a TOD plan is not specified.

4.2.5 Pattern Mode Entry (Test Command)

Mode commands shall allow selection of any defined pattern. Intersection controllers may contain the same or different programs which shall allow sub-system coordination or independent operation under time-base control.

4.3 DIAGNOSTICS

Diagnostic tests shall be continuous checks performed on system detector data, communications, and communication connected devices. Detected faults shall produce event failures at the arterial master and the central computer.

Failures shall be displayed on the arterial master. A fault isolation routine, selected from the front panel keyboard, shall identify the failed device. The operator shall have the ability to display all fault conditions on command.

4.3.1 Power Fail Restart

Following a power interruption, the arterial master shall update the clock and bring itself on-line automatically and gain control of the system.

4.3.2 Device Event Reports

If operating in a system, diagnostic failures shall be reported to the central computer as events. The following devices shall be monitored:

a. Communication
b. Local intersection controllers
c. System detectors
d. Local detectors

Report events shall verify system master and local intersection controller responses. Communication tests can be a specific test or results from normal evaluation during operation and shall be as follows:

a. System Master Test - A system master test failure shall occur when the master does not respond to central computer commands. If a response is received within three seconds following a failure, the failure condition shall automatically clear, restoring system master/computer service.

b. Local Intersection Controller Communication Test - A local intersection controller communication failure shall occur when valid data is not received by the master for five seconds. If data is received within five seconds following a local intersection controller communication failure, the failure condition shall automatically clear, restoring local intersection controller communications.

Local intersection controller events shall indicate CMU flash, local and commanded flash, cycle fail, coordination alarm, local and commanded free, coordination error, preempt, and user-designated events:

a. CMU flash - If intersection controller status indicates CMU flash for a period in excess of a user-programmable period of 0-30 seconds, the intersection controller shall fail and a CMU flash event shall be recorded.

b. Local Flash - If intersection controller status indicates CMU flash is OFF and flash is not commanded from the arterial master, the intersection controller shall be considered off-line and a local flash event shall be recorded.

c. Commanded Flash - If intersection controller status indicates flash, CMU flash is OFF, and flash is commanded from the arterial master, the intersection controller shall be considered off-line and a commanded flash event shall be recorded.

d. Cycle Fail - If intersection controller status remains in the same phase with opposing phase calls for two cycles during coordination or three minutes if the system is free, the intersection controller shall be failed and a cycle fail event shall be recorded.

e. Coordination Event - If intersection controller status indicates a coordination alarm condition, the intersection controller shall be failed and a coordination event condition shall be recorded.

f. Local Free - If intersection controller status indicates a free condition and free is not commanded from the arterial master, the intersection controller shall be considered off-line and a local free event shall be recorded.

g. Commanded Free - If intersection controller status indicates a free condition and free is commanded from the arterial master, the intersection controller shall be considered off-line and a commanded free event shall be recorded.

h. Coordination Error - If intersection controller status indicates a coordination error condition, the intersection controller shall be considered off-line and a coordination error event shall be recorded.

i. Preempt - If intersection controller status indicates a preempt condition, the intersection controller shall be considered off-line and a preempt event shall be recorded.

j. Event 1/Event 2 - If intersection controller status indicates an event 1 or event 2 condition, the intersection controller shall feed back user-designated alarm information and an event 1 or event 2 shall be recorded.

4.3.3 Detector Diagnostics

System detector diagnostics shall check for maximum presence, minimum presence, excessive counts, and no activity. If a system detector is diagnosed as failed or in error, then data supplied by that device shall be automatically eliminated from system computations.

Local detectors shall be checked for maximum presence and no activity only.

Detector diagnostics shall be performed each minute. Diagnostic periods shall vary depending on the diagnostic test.

Maximum presence events shall be generated by a continuous detector call during a user-specified diagnostic period. The diagnostic period shall be user-selected from 0-30 minutes.

Excessive count events shall be generated if a detector volume count is greater than or equal to a user-specified excessive count threshold. The diagnostic period shall be user-selected from 0-30 minutes.

No activity events shall be generated if vehicle counts are not received during a user-specified diagnostic period. The diagnostic period shall be user-selected from 0-255 minutes.

Detectors shall be failed when its operation is not within the specified criteria. A detector that begins functioning within the specified limits shall be returned to a non-failed status and its input used by the controller.

4.4 MONITOR EVENTS

Status changes and operating failure events at any intersection controller or arterial master shall be recorded by the arterial master at the time of failure or event occurrence. Events shall be reported to the central computer on a priority basis.

Reporting priority shall be selected by event or failure. It shall be programmable as: immediate, report with higher priority, or not at all.

Two telephone number entries shall be programmable from the central computer for reporting events to central computer and for reporting device failures to another maintenance computer or terminal. Device failure reports shall be transmitted to the designated computer or terminal only when scheduled by a TOD entry.

If the central computer is busy or off-line, a reporting arterial master shall repeatedly attempt to call at a preset retry interval in the range of three to fifteen minutes.

Reporting shall be selected for directing all events to a central computer and maintenance computer or terminal when this capability is selected. Printed events shall consist of the following categories:

a. Program and TOD changes
b. System events
c. Device diagnostics

4.4.1 Program and TOD Changes

Program and mode changes shall occur automatically as a result of traffic responsive plan computations, TOD scheduling, external, and manual commands. Program and mode event changes shall include the following:

a. In-effect program change
b. Traffic responsive program change
c. Special function change
d. Time-of-day interval change
e. Controller command TOD change

4.4.2 System Events

System events shall be arterial master self diagnostics. The diagnostic messages shall include:

a. Power-off (Comm-failure)
b. Power-on (Comm-failure)
c. Power interrupt
d. Clock error
e. Backup

Power-off event shall be stored in memory and reported when power is restored.

Power-on event shall report the time and date that power is restored. Time and date information shall be accurate if power is off less than 72 hours.

Power interrupt event shall report when power was off for less than one second.

Clock error event shall report when time and date information is different from the central computer reference. This event shall automatically occur whenever power was off greater than 72 hours. A clock error event shall inhibit TOD operation and scheduled reports until the clock has been reset and is functioning correctly.

Backup event shall indicate a data change in the arterial master memory. All memory shall be automatically re-initialized with a backup data base to allow continued operation.

4.4.3 Device Diagnostics

All device diagnostic failures shall be reported as events. Refer to Section 4.3 for diagnostic descriptions.

4.5 REAL-TIME DETECTOR LOGS

Real-time logs shall provide the operator with a permanent record of system detector data. Real-time logs shall consist of the following categories:

a. System detector log
b. Sample period log

4.5.1 System Detector Log

System detector logs shall show actual volume, and occupancy for user-specified system detectors. Volume shall be the number of vehicle counts accumulated, while occupancy shall be the actual percentage of time that vehicle presence was detected during a 15-minute log period.

Detector data intervals shall be user-specified by TOD scheduling. The user shall be capable of enabling and disabling the real-time log without affecting previous entries. At the end of the interval, the arterial master reports the log to the central computer for printing. The log shall not be stored on hard disk.

4.5.2 Sample Period Log

Sample period logs shall show computed parameters used in determining the traffic responsive plan selection. The sample period log interval shall be user-specified as a multiple from 1-6 sample periods by TOD scheduling.

If the default log period is programmed to be zero, the sample period log shall be reported when there is a change in the computed traffic responsive program. The user shall be capable of enabling and disabling sample period logs without affecting previous entries. The sample period log is reported to the central computer for printing. The log shall not be stored on hard disk. The sample period log shall consist of the following:

a. Scaled volume and occupancy for enabled system detectors
b. Scaled volume and occupancy for detector groups with assigned detectors
c. Current value of each program selection function
d. Smoothed value of each program selection function
e. Computed program selection values
f. Selected traffic responsive plan program
g. In-effect program and cycle length

Additionally, the printout shall identify groups that have not been assigned and parameters containing errors.

4.6 STATUS REPORTS

Manually commanded status reports shall be provided to allow the operator at the central computer an immediate record of system operations. Reports shall consist of the following categories:

a. System status
b. Controller failure summary
c. System detector failure summary
d. Current 15-minute system detector log

4.6.1 System Status

System status report shall describe the system operating conditions. The report shall be a concise printout including the following:

a. Traffic responsive program (computed values)
b. Traffic responsive plan
c. Program-in-effect and source
d. Special function status
e. Communication status:
    1. System master communication failure
    2. Local intersection controller communication failure
f. Intersection controller status:
    1. On-line
    2. Off-line
    3. Failed
g. System detector status:
    1. On-line
    2. Failed
h. Local detector status:
    1. Failed

Local detectors shall be identified by intersection controller number and assigned phase. Intersection controller off-line shall indicate a disabled intersection controller or a non-coordinated intersection controller due to the following conditions: preemption, coordination error, local free, commanded flash, or local flash.

4.6.2 Intersection Controller Failure Summary

Intersection controller failure summary shall identify failed intersection controller(s) and probable cause(s). Probable failure causes shall be as follows:

a. Communication
b. Cycle failure
c. CMU flash
d. Coordination alarm

4.6.3 System Detector Failure Summary

System detector failure summary shall identify failed system detector(s) and probable cause(s). The possible failure causes shall be as follows:

16.8 PEDESTRIAN ISOLATION CARD CONNECTOR

The isolation card shall be designed with an edge connector. The connector shall be 22 position, dual inline type connector with the following position assignments:

PIN	FUNCTION	PIN	FUNCTION
2A/1	SPARE/CH 1 ØWALK	N	AC(+) 120 V
B/2	SPARE/CH 2 ØWALK	P	SPARE
C	SPARE	R	SPARE
D	INPUT #1	S	SPARE
E	INPUT COMMON	T	SPARE
F	OUTPUT #1 (COLLECTOR)	U	SPARE
H	OUTPUT #1 (EMITTER)	V	SPARE
J	INPUT #2	W	OUTPUT #2 (COLLECTOR)
K	INPUT COMMON	X	OUTPUT #2 (EMITTER)
L	CHASSIS GROUND	Y	SPARE
M	AC (-) 120 V	Z	SPARE

TABLE 18A-6
PEDESTRIAN ISOLATION CARD CONNECTOR ASSIGNMENT

16.9 CARD RACK

Card racks shall be designed with top and bottom card guides for four-four channel detector cards mentioned above, two-two channel isolation cards, and a power supply installed in type 6 cabinets and two-four channel detector cards mention above, two-two channel isolation cards, and a power supply in type 3 and 5 cabinets.

The housing shall be constructed of 5052 aluminum alloy of a minimum thickness 0.062 inch with a protective coating (painted or anodized). Removable covers shall be provided on top, bottom, and back allowing access to the internal hardware and circuitry. Each cover shall be easily removable with the use of conventional hand tools.

The dimension of the rack in type 3 and 5 cabinets shall be approximately 10 inches wide, 6 inches high and 9 inches deep and in type 6 cabinets shall be approximately 14 inches wide, 6 inches high and 9 inches deep. The rack shall be mounted on the inside of the door of type 3 cabinets as shown in drawing 18-A and attached to the bottom shelf in type 5 and 6 cabinets, hinged to swing out to provide access to the rear assembly without removing the shelf(s).

The card rack for type 3 cabinet shall be as above except: the top shall be rain proof with a drip edge to prevent water from running across the lower side of the top and into the rack and shall have a power supply, two - four channel detector cards positions, and two - two channel isolation cards. These shall be wired as follows: first card detector to vehicle call input 1 through 4, second card detector to special

detector inputs 1 through 4, first isolator card to pedestrian detector inputs phases 2 and 4, and second isolator to preemptions 1 and 2.

The power supply shall meet the dimensional requirement of a four channel card rack detector type 8, operate on 120 VAC, 60 Hz, and the AC+ into the power supply shall be fused. The fuse shall be located on the supply card, permanently labeled indicating the fuse and size. The supply shall meet NEMA specifications and provide 24 VDC, 385 ma, regulated as specified in NEMA TS-2-1989, Section 15.2.6.2. A power indicator and a fuse shall be provided on the front of the supply for each output. A pull handle shall be on the front of the unit. The power supply shall be located on the left side of the rack when viewed from the front. DC voltage from the power supply shall not be supplied to the isolator positions.

The rack shall be wired with a separate power cord and individual wires to each card position. The power cord shall have each wire identified with a sleeve marked, DR-AC+, DR-AC-, and DR-Gr, and terminated with a spade terminal connected to the terminal for the controller power. Each module slot shall be wired directly to the card edge connector with color coded harness. The harness shall meet the requirements for wiring elsewhere in this standard. Each detector lead in from the field wiring shall be a twisted pair. A sufficient amount of slack in the wiring harness shall allow the rack to be moved for visual inspection and mechanical repairs. The wiring shall be cabled together into a harness, attached to the back right side (viewed from the front) with an approved cable clamp, and routed to the back and detector panel.

The cards in the rack shall be numbered from left to right viewed from the front in order to identify the position function. For type 6 cabinets the first position will be the power supply; the second, a four channel detector for phases 1, 2, 3, and 4; the third, a four channel detector for phases 5, 6, 7, and 8; the fourth, a four channel detector for special detectors 1, 2, 3, and 4; the fifth, a four channel detector for special detectors 5, 6, 7, and 8 ; and the sixth and seventh, each a two channel isolation card for pedestrian detection to phase 2, 4, 6, and 8 respectively. For type 3 and 5 cabinets the first position will be the power supply; the second, a four channel detector for phases 1, 2, 3, and 4; the third position, a four channel detector for special detectors 1, 2, 3, and 4; the fourth and fifth position each a two channel isolation card for pedestrian detection to phase 2 and 4, and preemption input to 1 and 2.

Wiring from each detector and isolator output shall be directly to and terminated to the front of the back panel at their associated terminals of the controller. The control circuit wiring for each detector and isolator input shall be made directly from the associated terminals of the controller. The wiring for the field input to the card rack shall be terminated with the associated terminal on the detector panel. Each wire from the card rack to the back panel shall be terminated using a spade type compression terminal and an identification sleeve identifying each as follows: Detector position one, VD-1-1, VD-1-2, VD-1-3, and VD-1-4; the input to these card positions shall be identified as: VD-1-1G, VD-1-2G, VD-1-3G, and VD-1-4G. The remainder of the detector wiring shall be identified in a similar manner. The pedestrian detector isolator cards outputs shall be identified as: Isolator position nine: PD-1-1 and PD-1-2, the inputs: PD-1-1W and PD-1-2W. The other isolator shall be identified similarly using PD-2-,etc.

17.0 MECHANICAL CONSTRUCTION OF ENCLOSURES

The cabinet shall be constructed of sheet or cast aluminum alloy.

17.1 SHEET ALUMINUM

The sheet aluminum alloy shall be ASTM No. 5052-H32 or equivalent, and shall have a minimum sheet material thickness of approximately 1/8 inch.

17.2 CAST ALUMINUM

The cast aluminum alloy shall be ASTM No. 356-75 or equivalent. Flat cast surfaces exceeding 12 inches in both directions shall be a minimum of 1/4 inch (0.25 inches) in thickness. Flat cast surfaces not exceeding 12 inches in both dimensions shall be a minimum 3/16 inch (0.1875 inches) in thickness.

17.3 OUTLINE DIMENSIONS

Outline dimensions shall be as shown in Table 18A-7. All dimensions are outside of cabinet and in inches exclusive of hinges, handles, overhang(s), vent housing and adapters. Cabinet heights are measured to the lowest point of the top surface of the cabinet. The combined overhangs of the top of the cabinet shall not exceed four inches. Type 4 cabinets will be a combination of an empty type 2 cabinet or a meter base cabinet on bottom and a type 2 or 3 cabinet on top.

CABINET TYPE	WIDTH	HEIGHT	DEPTH
2	22 (-0 + 15%)	***45 (-0 + 10%)***	15 (-0 + 15%)
3	22 (-0 + 15%)	***45 (-0 + 10%)***	15 (-0 + 15%)
4	22 (-0 + 15%)	60 (-0 + 20%)	15 (-0 + 15%)
5	30 (-0 + 10%)	46 (-0 + 18%)	16 (-0 + 15%)
6	38 (-0 + 10%)	52 (-0 + 15%)	24 (-0 + 15%)
7	38 (-0 + 10%)	72 (-0 + 15%)	24 (-0 + 15%)

TABLE 18A-7
CABINET DIMENSIONS

17.4 FINISH AND SURFACE PREPARATION

17.4.1 Painted Aluminum Cabinets (When specified)

The color shall be medium green, OAAA #144. The surfaces of the cabinet shall be suitably prepared prior to priming. Unpainted interior surfaces shall be permissible in aluminum cabinets. Exterior surfaces shall be primed and painted to provide a durable exterior finish. If the primed surfaces are scratched or damaged, the affected area shall be re-primed prior to painting.

17.4.2 Unpainted Aluminum Cabinets (Shall be provided unless otherwise noted).

Unpainted aluminum cabinets shall be fabricated from mill finished material and shall be cleaned with appropriate methods that will remove oil film, weld black, mill ink marks and render the surface clean, bright, smooth and non-sticky to the touch.

17.5 SHELVES

Cabinets shall be provided with a minimum of one shelf in type 2 and 3, two shelves in type 5 and 6, and three shelves for type 7 to support control equipment. Type 2 and 3 cabinets shall have provisions for positioning the shelf between 10 inches from the bottom and within 8 inches from the top. Type 5, 6, and 7 cabinets shall have provisions for positioning shelves between 24 inches of the bottom of the cabinet and to within 8 inches of the top of the cabinet in increments of not more than 2 inches. The adjustment of the shelves shall be accomplished by using small hand tools. Rivets are not acceptable. All shelves shall have a raised back edge to stop equipment from passing the back edge of the shelf. This edge shall be a minimum of 1/2 inch from the rear wall of the cabinet and be constructed from one continuous piece of metal.

All cabinets shall have a 1 ½ inch drawer, mounted directly beneath the lowest shelf. This drawer shall have a hinged top cover and shall be capable of storing documents and miscellaneous equipment. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of the available depth offered by the cabinet and controller shelf, and shall have approximately the same width as the corresponding back panel. The bottom of the drawer shall have drain holes sufficient to drain any amount of accumulated water in the drawer.

17.6 TOP SURFACE CONSTRUCTION

Cabinets shall be manufactured to prevent the accumulation of water on its top surface and slope in a manner to drain water to the back side of the cabinet. The highest point of the top surface shall be limited to a maximum of six (6) inches added to the overall height of the cabinet.

17.7 DOORS

17.7.1 Main Cabinet Door

Cabinets shall have a single hinged main door which permits access to all equipment within the cabinet and visual inspection of all indicators and controls. Unless otherwise specified, the door shall be hinged on the right side of the cabinet as viewed from the outside facing the cabinet door opening. Type four (4) cabinets shall have two main doors equally dividing the height of the cabinet front with clearances at top, middle, and bottom.

17.7.2 Hinges

All cabinet doors shall incorporate suitable hinges utilizing stainless steel hinge pins. Hinges shall be protected to prevent being removed or dismantled when cabinet door is closed. Attachment to the cabinet shall produce a smooth finish, protruding fasteners are not acceptable.

17.7.3 Door Stop

Each cabinet shall be provided with a door stop which holds the door open at positions of 90° ± 10° and 170° ± 10°. A means shall be provided to minimize accidental release of the door stop. Type seven (7) cabinets shall have the door stop located at the bottom of the door and all other cabinets shall have the stop located at the top of the door.

17.7.4 Locking Mechanism

All cabinets shall incorporate a main door lock constructed of nonferrous or stainless steel materials, which shall operate with a traffic industry conventional #2 key. A minimum of one key shall be included with each main cabinet door lock.

A three - point lock on the strike edge of the door shall be provided with all types of cabinets except when specified to be different on the order or plans. The three (3) points of the lock shall be located at the top, bottom, and middle of the strike edge of the door.

The lock shall prevent operation of the mechanism when in the locked position.

The door handle shall rotate inward from the locked position so that the handle does not extend beyond the perimeter of the door at any time. The operation of the handle shall not interfere with the key, police door or any other cabinet mechanism or projection. The handle shall have the mechanical strength to operate the mechanism and shall be made from non-corrosive material.

Cabinets with three point lock shall be provided with a means of externally padlocking the mechanism. A minimum 3/8 inch diameter lock shackle shall be accommodated. The lock shaft shall be 5/8 inches in diameter.

17.7.5 Door Opening

The main door opening of all cabinets shall open on and be centered within the front side having the width dimensions listed in the previous table and shall be at least 69% of the area of the side. Necessary clearances shall be provided allowing unrestricted movement of the door from closed position to open position. The door shall seal against a minimum of one inch wide neoprene sponge gasket with tight seams. The top gasket shall be the width of the door, the side gaskets shall begin below the top gasket and the bottom gasket shall be within the side gaskets. A gasket retaining ring shall be installed on the inside of the gasket.

17.7.6 Police Compartment

A hinged police compartment door shall be mounted on the outside of the main cabinet door. The door shall permit access to a police panel compartment for operation of switches defined elsewhere in these standards. The compartment shall be constructed to restrict access to exposed electrical terminals or other equipment within the cabinet. The door shall seal against a neoprene sponge gasket in the same manner as stated above for the main door.

Space shall be allowed for the switch controls and storing of the manual control cord in the police panel compartment with the door closed. The minimum internal dimensions shall be 3-1/2 inches high, 6-3/4 inches wide and 2 inches deep. Additionally, the volume shall be not less than seventy (70) cubic inches.

Police doors shall be equipped with a lock which can be operated by a police key, Corbin Type Blank 04266, or equivalent. A minimum of one key shall be included for the police compartment of each cabinet.

The police compartment shall be located above the bottom of the main door as shown in the following table:

CABINET TYPE	LOCATION
2 and 3	2.5" ± 10% from bottom and left of center, see Drawing #18A
5	30" ± 10%
6 and 7	39" ± 10%

TABLE 18A-8
POLICE COMPARTMENT LOCATION

17.8 CABINET MOUNTING

17.8.1 Pole Mounted Cabinets Type 2 and 3

The cabinets shall be provided with provisions to attach a pole bracket to a reinforcement plate permanently mounted to the back, top, and center of the cabinet. The reinforcement to the cabinet shall be designed to support the weight of the cabinet and the equipment intended to be contained within and the structural loads referred to in this specification. The minimum width of the adapter shall be six (6) inches wide and three (3) inches high, tolerance of both -0 inch, +6 inches. Two 3/8 inch holes shall be drilled through the cabinet, within the reinforced area, two inches from center line of the width of the cabinet. Countersink each hole on the outside of the cabinet for flat head screws. Install two 5/16" flathead screws in the mounting holes with the top of the screw heads to be flush with the surface of the cabinet wall.

The cabinet shall be pre-drilled for two (2), 3" wire entrance holes, one in the top and one in the bottom, both at the back edge and centered on the width of the cabinet and one (1) 2" entrance hole adjacent to the three inch hole on the bottom as shown in the attached drawing. Three hubs shall be provided with type 2 and 3 cabinets. The hubs shall centered on the entrance holes and attached to the cabinet using four (4) 5/16 inch-18-tpi by 1-1/2 inch long hex head bolts, with lock washers and hex nuts. The hubs and cabinet shall be pre-drilled for mounting the hubs to the cabinet with the above mentioned bolts using a bolt pattern of 2-1/8 inches centered on a line perpendicular to the back of the cabinet, by 3-3/4 inches parallel to the back of the cabinet. The centers of the bolt pattern on the hub and the wire entrance hole shall coincide. The location of the hubs shall allow minimum clearance for box end wrenches to fit onto the nuts within the cabinet.

17.8.2 Pedestal mounted cabinets Type 2 or 3

When specified on the order or plans the requirement for a pedestal mounted cabinet shall meet the following requirements. The specified cabinet shall be provided and equipped with a reinforced bottom, 1/4" aluminum plate, and a slip fit adapter for attachment to a standard four inch inside diameter pipe. The bottom of the cabinet shall be provided with an access hole for cable (min. 4 inches) and mounting holes for the adapter located in the center of the bottom. The adapter shall be bolted to the cabinet with 5/8" bolts and fitted on a 6-1/2" bolt circle. The attachment to the standard four inch pipe shall be secured with four square headed set screws. The holes drilled for pole mounting hardware and wiring shall be covered with gaskets and blank hubs.

17.8.3 Base mounted cabinet Type 4

The type 4 cabinet shall consist of two separate upper and lower cabinets. Both shall have doors specified above and shall be constructed without interference when opening or closing. A base adapter shall be provided for mounting the lower cabinet to the foundation specified in the signal plan detail sheets and within this standard. The order or plans will specify the type cabinet to be the top cabinet, type 2 or type 3. The drilled center hole specified for a pedestal mount shall be provided for wire-way between the cabinets. All other holes will be covered with a blank hub and gasket as specified above. A terminal panel shall be provided with the signal circuits, interconnect, communications, and power individually terminated and labeled. When a type 3 cabinet is required, additional terminals shall be provided for the loop and pedestrian lead-in terminations.

The base adapter shall separate the lower cabinet from the foundation a minimum of 4" and a maximum of 6". The cabinet shall be sized to provide the correct dimension of the completely assembled unit to meet the dimension requirements stated above. The adapter shall be constructed for mounting on the foundation shown in Figure 18A-1. The complete unit shall be securely connected with removable fasteners and meet the requirements for security in this standard.

The interior anchor brackets shall transverse the cabinet. Each bracket shall attach to one edge adjacent to the bracket. The strength of the bracket shall prevent the cabinet from being lifted from the concrete base with a load of fifty pounds acting at the top, front or back of the cabinet. An alternate method of cabinet support can be a 1/4" aluminum reinforcement plate meeting the requirements shown in Figure 18A-1.

17.8.4 Base mounted cabinets Types 5, 6, and 7 (Types as specified on order or plans)

The cabinet or its base adapter shall be so constructed that it can be mounted on the foundation shown in Figure 18A-2.

The interior anchor brackets shall transverse the cabinet. Each bracket shall attach to one edge adjacent to the bracket. The strength of the bracket shall prevent the cabinet from being lifted from the concrete base with a load of fifty pounds acting at the top, front or back of the cabinet.

17.8.5 Anchor bolts

Anchor bolts for base mounted cabinets shall be 3/4 inch diameter and 16 inches long. A 90° bend with a 2 inch leg on one end and a minimum of 3 inches with a UNC-10 thread shall be provided. Anchor bolts shall be steel with hot dipped galvanized finish. Each anchor bolt shall be furnished with one 3/4 inch UNC-10 HDG steel nut and one 3/4 inch HDG flat steel washer. Two anchor bolts shall be provided with each cabinet.

17.9 CABINET STRUCTURAL TESTS (mounting shall withstand the following:)

17.9.1 Hinges and Door

The hinge and door assembly shall be of sufficient strength to withstand a load of 30-pound-per-vertical-foot of door height. This load shall be applied vertically to the outer edge of the door when it is opened to the 90 degree position. There shall be no permanent deformation or impairment of the door, locking mechanism, or door seal function after the load is removed. A stiffener shall be installed the width and at mid height of the door. The door panel shall be flat after fabrication.

17.9.2 Door Stop

Both the door and door stop mechanisms shall be of sufficient strength to withstand a simulated wind load of 5 pounds per square foot of door area applied independently to the inside and outside surfaces without failure, permanent deformation, or any major movement of the door positions. For test purposes, a test load shall be applied to the vertical midpoint of the outer edge of the door at a right angle to the plane of the door. The test load shall equal one half of the calculated wind load. The force shall be applied first on the inside edge, then on the outside edge. These tests shall be performed with the door at 90° and 170° positions.

17.9.3 Lock

The door handle and associated cabinet locking mechanism shall withstand a torque of 100-foot lbs. applied in a plane parallel with the door to the handle in the locked position. The door handle and the external padlock mechanism shall meet the same requirement without the internal locking mechanism securing the handle.

17.9.4 Shelves and Drawer

Shelves shall support a load equivalent to 2 pounds per inch of length without deforming more than 1%. The test load shall be applied at two points, 6 inches to each side of the shelf's center, with the shelf installed in the cabinet. The drawer shall support up to 50 pounds in weight when fully extended.

17.10 EQUIPMENT PROTECTION

Cabinets are intended to provide protection for the housed equipment. Prying open or dismantling the doors, walls, or tops, shall be prevented with the cabinet securely closed.

When completely and properly installed, cabinets shall have provision for rain water drainage. The cabinet shall not permit water to enter the equipment cavity above any live part, insulation, or wiring.

17.11 RAIN TEST

All cabinets shall be designed to meet the requirements of the following tests. To insure realistic testing, the enclosure and enclosed equipment shall be mounted as intended for use.

A continuous water spray, using as many nozzles as required, shall be applied against the entire top and all exposed sides of the enclosure for 10 minutes at a minimum rate of 18 inches per hour of equivalent rain at an operating pressure of 4 to 5 pounds per square inch. The distance of the nozzles to the cabinet shall be a minimum of 36 inches and a maximum of 48 inches and located above the top edge of the cabinet.

The enclosure is considered to have met the requirement of this test if there is no significant accumulation of water within the enclosure and no water is visible on the live parts, insulation materials, or mechanism parts.

A rain test which is performed in accordance with Underwriters Laboratories, Inc., "Rain Tests of Electrical Equipment, Bulletin of Research #23, September, 1941", is considered to be equivalent to this test.

17.12 AUXILIARY EQUIPMENT

17.12.1 Fan and cooling system

All cabinets shall be equipped with a cooling system of sufficient capability to pass the test described in NEMA TS1-2.2.04. The fan shall be capable of operating continuously for a minimum of 6000 hours in a 122°F (50°C) environment without need for after-installation maintenance and deliver 100 CFM in free air. The fan shall be thermostatically controlled by switching the 120 VAC supply to the fan. The thermostat shall be field adjustable to switch on and off at any temperature between 70° and 160°F.

The exhaust shall be vented through the upper portion of the cabinet. All ventilation shall be rain-tight and shall prevent any water from dripping into the cabinet.

The cooling system shall be constructed to allow cleaning of the vents, screens and fan. Fasteners for removing panels to gain access to perform the above requirement of cleaning shall be removable with the use of simple hand tools, except as noted in Section 17.12.2.

An additional duplex receptacle (for use with communications modems) shall be mounted and wired in the upper left side of the cabinet assembly. This receptacle shall be wired on the load side of the 20 Amp circuit breaker.

17.12.2 Air Filter

The cabinet shall be equipped with a secured, replaceable filter for the incoming ventilation air. The air filter shall be removable without the use of tools. The filter size shall be: 7-1/2 inches high x 7 inches wide x 1 inch deep for the Type 2 and 3 cabinets, 10 inches high x 20 inches wide x 1 inch deep for the Type 5 cabinets, and 14 inches high x 25 inches wide x 1 inch deep for Type 6 and 7 cabinets. The filter shall have clearly indicated on it the size and direction of air flow. A metal grid shall be on both sides of the filter. The filter shall meet ASHRAE standard 52-76 for disposable, Type II, glass fiber air filters. The air resistance shall be 0.08 inch WC, measured on 24 inches x 24 inches sample at 300 FPM. The efficiency of the filter shall be a minimum of 75%.

17.12.3 Plan Holder (DELETED)

17.12.4 Cable Hanger (DELETED)

17.12.5 Cabinet Light

A fluorescent bulb and fixture shall be installed in cabinet types 2 and 3. The fixture shall be mounted against the cabinet top and the strike edge for the door. The fixture shall not extend beyond the strike edge at the top of the cabinet and shall not restrict the opening of the door. Mounting supports shall be on the front of the cabinet. The fixture shall have an on/off switch mounted on the side of the fixture. The fluorescent bulb shall be a *F8T5WW*.

A fluorescent bulb and fixture shall be installed in cabinet Types 5, 6, and 7; and when specified in other cabinets. The fixture shall be within the upper 3 inches from the top and toward the door side of the cabinet. It shall illuminate the interior of the cabinet without hampering the vision of service personnel while inspecting the cabinet. The fluorescent bulb shall be a 15 watt, T-12, 18 inches in length. The fixture shall be of a sturdy construction to hold and operate the above mentioned bulb. For Types 5, 6,

and 7, the cabinet light shall be turned on when the cabinet door is opened and turned off when the cabinet door is closed.

17.12.6 Cabinet Hubs

The hubs for the cabinets shall be cast aluminum, ASTM B-108 and those standard specifications referenced there in. The bolt pattern shall be as details in the drawings 18-A. The blank shall be a flat plate, 1/4 inch thick. All other hubs shall have a conduit threaded collar that shall be a minimum of 2 inches from the base of the hub. The threaded opening shall be centered within the 3-3/4 inches dimensions of the hub with outside edge of the threaded collar in line with the base of the hub. All hubs shall be provided with stainless steel bolts casted into the hub. The outside of the hub shall provide a smooth design that will shed water. On the hubs with larger threaded collar(s), the bolting pattern shall be maintained. The following table are the designations and type of hubs that will be specified on the order or plans.

TYPE	OPENING(S) SIZE	OPENING DESCRIPTION
Blank	-0-	no opening, flat plate, 1/4" minimum thickness
Single	3/4 in.	one opening, 3/4" conduit thread
Single	1 in.	one opening, 1" conduit thread
Single	1-1/2 in.	one opening, 1-1/2" conduit thread
Single	2 in.	one opening, 2" conduit thread
Single	2-1/2 in.	one opening, 2-1/2" conduit thread
Single	3 in.	one opening, 3" conduit thread
Double	3/4 in.	two openings, 3/4" each conduit thread
Double	1 in.	two openings, 1" each conduit thread

TABLE 18A-9
CABINET HUB DESCRIPTION

17.12.7 Clamp Pole Mounted Cabinet

A pole clamp shall be provided with the controller cabinet types number 2 and 3 for mounting the cabinet to the pole. The clamp shall be cast aluminum meeting the requirements for the cabinets and designed to hold the weight of the mentioned cabinets and the equipment contained within. The design shall provide four contact points with the pole and shall be adjustable for pole diameters from 10 inches to 12 inches. The clamp shall be divided into two parts, one half to be attached to the cabinet and the other half to be installed on the "back" side of the pole. The clamp shall have a slotted opening for coupling the clamp together using 5/8 inch galvanized all thread bolts and nuts. The clamp shall have a flat surface area, 4-1/2 inches x 2 inches minimum that attaches to the cabinet. Two 5/16 inch - 18 tpi, drilled and tapped holes spaced 4 inch center to center shall be centered within the flat area. The flat area shall space the back of the cabinet a minimum of two inches from the pole.

17.12.8 Adapter Pole Mounted Cabinet

When specified, an adapter shall be provided, excluding lag bolts or steel bands. The adapter shall be conformable for mounting to round poles with a 4-1/2 inches or larger diameter. Material for the adapter shall be comparable with aluminum alloy 6061 and have the mechanical strength to hold the weight and loading requirements for the cabinet. The adapter shall accommodate lag bolts up to ½ inch and steel banding up to 1 inch wide. The adapter shall have the same mounting bolt pattern and wire way requirement as the hubs stated in 17.12.6. The adapter shall be mounted to the cabinet using the same mounting bolts as the hubs, and additional gaskets shall be used between the cabinet, hub, and adapter.

17.12.9 Adapter Slip-fit Four Inch Pipe

The adapter shall slip-fit to a standard four inch pipe and shall secure to the pipe with four square headed set screws. The adapter shall be made of cast aluminum or steel designed to hold the weight of the cabinet and the loading characteristics required for the cabinet. The length of the adapter shall be approximately eight inches long. The adapter shall be attached to the cabinet with 5/8" bolts and fitted on a 6-1/2" bolt circle.

18.0 CABINET INTERIOR PANELS

18.1 GENERAL REQUIREMENTS

All panels shall be made from structural grade sheet aluminum equal to 2024 or 5052 aluminum alloy. Approval from the Department is needed if different material than listed above is used for the panels. The panels shall be attached to the cabinet walls with bolts, nuts, and washers specified elsewhere in this standard. Each panel shall be completely removable or capable of folding down from the cabinet wall without the need to remove any other panel or shelf so that inspections and repairs may be made behind each panel. All panels shall be grounded to the cabinet using a braided copper conductor equaling #6 AWG. All panels shall be sized to fit within the minimum dimension of the cabinet it is specified for as listed in Table 18A-7.

18.2 GENERAL WIRING DESIGN REQUIREMENTS

The inspection and repair of any panel shall not require disconnecting or removing wires. When multiple panels are required in the cabinet then the cable shall follow a single route and shall be from the detector/auxiliary panel to back panel to power panel to police panel. Cabling shall conform to the previously stated requirements for servicing each panel. Cable(s) shall be secured to the panels at the point where it leaves and/or enters each panel. The cable shall be secured to the cabinet wall with a cable clamp at two (2) points equally spaced between the panels on the above stated route. Wiring requirements for ventilation, temperature monitoring, and cabinet lighting shall be from the power panel to each device and shall be neat and in accordance with good wiring practices. A separate, parallel cable route shall be used from the field terminal to the back panel solid state load relay outputs.

18.3 IDENTIFICATION OF COMPONENTS, TERMINALS, AND CONNECTORS

Each terminal position, sockets, switches, filters, relays, and fuses shall be permanently labeled by painting, printing or engraving directly onto the panel or terminal strip identifying the position number

and/or function of the terminal or device (paper labels of any type will not be accepted). Each harness shall be permanently labeled to identify function or connector with only the following:

HARNESS	LABEL	HARNESS	LABEL
NEMA Connector A	"A"	Conflict Monitor	"CMA"
NEMA Connector B	"B"	Conflict Monitor	"CMB"
NEMA Connector C	"C"	All Harnesses	Labeled with function
Controller Connector D	"D"	Additional harnesses may be identified later.	

TABLE 18A-10
HARNESS LABELS

18.4 IMPLEMENTATION OF EQUIPMENT CAPABILITIES

The wiring between the panels shall connect the functional inputs and outputs needed to implement the operational capabilities of the equipment and requirements of this standard. Input circuits to the controller for external controls shall not be wired: i.e.; hold, omit, force off, CNA I&II, control status bids, phase next, phase on, phase check, red omit, pedestrian recycle, max I&II, max inh. There shall be no discrete circuit, components or active devices attached to any panel or cabinet wall except as specified. Printed circuit boards are not allowed on any panel.

18.5 BACK PANEL

The back panel shall be located on the lower half of the back cabinet wall. The controller and conflict monitor harnesses shall be terminated on the upper portion and shall be secured to the top left corner of this panel with non-chafing cable clamps as described elsewhere in this standard. All wires shall be installed for the D and E connector functions listed in the appendix, between terminal positions and a receptacle on the back panel. The receptacles shall be square flange, with sockets connector, permanently mounted on the back panel, D receptacle - AMP206438-1, E receptacle - AMP2064038-1. The D connector on the harness shall be an AMP 206437-1 or an exact equivalent. A E harness connected to the Emergency Vehicle Detection System shall be provided with the EVDS equipment. The E connector on the harness shall be an AMP 206039-1 or an exact equivalent. The pins and sockets shall be gold finished. (Engineering note: EVDS equipment is specified in a separate document. All cabinets provided to DOTD shall be equipment to receive the EVDS equipment and provide the required functions as stated elsewhere in this standards.)

The wires from the controller harnesses, panel mounted receptacle, and other required devices shall be grouped by associated functions and terminated individually at a position on a terminal strip, (example - all inputs, by cycle, offset ... etc.). The terminal blocks and cabling for each harness shall be separate and have no wires crossing others from a different harness. Each terminal position shall be permanently identified with the associated function in the connecting equipment. Wiring to this panel from other equipment specified elsewhere in this specification shall be given extra lengths to allow movement between controller terminal positions for field changes.

All harnesses shall be five feet long from the point that is held by the cable clamp to the connector on the free end. The connector on the free end of the harnesses shall be a designated connector by the

manufacturer. Any additional connectors and harnesses necessary to implement the controller and system operations specified herein shall be supplied by the manufacture meeting this standard.

For type 2 and 3 cabinets the panels shall be constructed in accordance with LA DOTD drawings #18A-1. The harnesses for type 2 and 3 cabinets shall be three feet long from the point that is held by the cable clamp to the connector free end.

18.5.1 Connectors

Controller and monitor harnesses shall utilize Mil-C-26482 Series 1 and AMP CPC type series 2 connectors. The controller harness connectors shall be as described elsewhere in this standard. The monitor harness connectors shall be as follows:

MONITOR Number of Channels	CONNECTOR
6	MS 3116F-22-55SY
12 Connector A	MS 3116F-22-55SZ
12 Connector B	MS 3116F-16-26S

TABLE 18A-11
MONITOR CONNECTORS

18.5.2 Harness Wire Termination

The monitor's signal input channels and voltage monitoring circuits shall be terminated on the appropriate terminals. The following shall be terminated at one position in all cabinets: harness wiring listed in NEMA-TS-1 Section 13 except as noted above, each input and output of the load cells, input and output of the controller, and the output of the flash transfer relays. The terminal blocks shall be either single row feed-through or double row type (electrical requirements described elsewhere in this standard). Exceptions to the requirement for single position termination for each wire are AC-, chassis ground, logic ground and flashing outputs. Listed below are the minimum terminals required for each:

a. Logic Ground - Three (3) adjacent positions
b. AC- - a separate copper or brass multi-terminal bus bar shall be mounted near the lowest portion of the panel, adjacent to and horizontally aligned with the signal field terminals. It shall be insulated from the cabinet and connected to AC- on the power panel with a single #6 AWG insulated wire. The bus bar shall be sized to accept 5 - #14 AWG solid wires at each terminal and shall have a minimum of 12 positions. This bus shall be used to terminate all the neutral circuits from cable wired to the signal heads.
c. Flashing outputs - each circuit of the transfer relay shall have different flashing circuits.

All terminations shall be grouped by function as listed in NEMA TS-1 standards, Section 13, Tables 13-1 and 13-2. The signal load cell inputs shall be terminated below all other controller and monitor harness termination.

Panels for cabinet types 2 and 3 shall only have terminations of all voltage, monitoring, and coordinator circuits of the controller. The controller load cell controls shall be wired to the load cell receptacle and other requirements shown in drawings #18A. A single harness shall contain the circuits for A and B connectors. The connectors shall be offset along the end of the harness by six inches. Load cells shall be provided as follows: eight cells, four phase, two overlaps, two pedestrians (Additional details shown on drawing #18A).

Panels for cabinet type 5 shall have the phase overlap outputs "A" and "B" shall be wired respectively to load cells 5 and 6. Pedestrian outputs for phase 2 and 4 shall be wired to load cells 7 and 8 respectively.

Type 6 cabinets shall have overlap outputs "A" through "D" wired respectively to load cells 9 through 12. Wiring shall be arranged on the back panel to facilitate connecting the pedestrian outputs to the load cell inputs by moving wires, without adding wire, connectors, or terminal blocks.

(Engineering Note: The only controller outputs and load cell inputs circuits that are to be terminated on terminal strips are those circuits used for overlap and pedestrian indications. In accordance with the specification these circuits shall be provided to change the inputs of these load cells from either overlap or pedestrian outputs. In addition this will allow the reset circuit for pedestrian isolator cards to be terminated with the correct controller output. This requirement shall be for both the type 5 and 6 cabinets. In reference to logic ground within the cabinets this notation shall apply to all circuits. All reference to logic ground shall be through connector "A" of the controller. In cases where specific controls are used in connector "D", then logic ground of this harness may be used. In all cases logic ground through any connector shall be the same reference within the controller.)

When specified on order or plans, overlaps shall be terminated at different positions than specified above.

18.5.3 Load Cells and Flash Transfer Relays

Signal load cells shall be provided, one for each phase and each overlap. When specified, additional positions and load cells shall be provided for four pedestrian signals in line with the load cells previously specified. All flash transfer relays shall be located on the back panel, adjacent to the load cells. A solid state flasher shall be provided and located as stated below.

The position of the load cells, flashers, and transfer relays shall be between the terminals for the load cell inputs and outputs. In type 2 and 3 cabinets the position of the load cells, flashers, and transfer relays shall be in accordance with drawings #18A. The area above the load cells and flasher shall be open to allow the ventilation to flow freely away from the load cells.

The AC+ for the signal load cells shall be terminated as previously specified and be capable of carrying 60 amps, equally distributed to each signal load switch from a terminal strip on the back panel.

The transfer relays shall be operated directly by the voltage to transfer the signal operation from sequential to flashing. No intermediate relay shall be used between the transfer relays and signal operate/flash circuit. The transfer relays shall be energized during normal operation to connect the signal load cells to the field terminals.

18.5.4 Signal Field Circuits

The output from the load cells shall be located on the lowest terminal strip at the bottom of the back panel. Wiring from the signal heads shall be terminated separately for each indication and there shall be no internal cabinet wiring terminated on the same terminal. The inputs and outputs of the flash transfer relay shall be terminated above and adjacent to the load switch outputs. The arrangement of these terminal strips shall allow the selection of either red or yellow signal indications to flash without needing to un-solder or solder connections. The number of signal circuits which will be transferred to flashing circuits shall equal the maximum number of load switch positions specified. No wiring shall be installed on the terminal for the field wiring.

18.6 POWER PANEL

The power panel shall be mounted on the lower right inside of the cabinet. It shall receive a single phase, 120 VAC, 60 Hz electrical service and shall have three (3) separate terminals for terminating the wires from the service source. This panel shall provide the power required and necessary functions, including cabinet ground, to each panel. The service terminals shall be a mechanical compression type, sized to accept a wire range from #8 to #2 AWG, stranded wire. A ground bus bar shall be located on the lower portion of this panel and terminate all ground circuit within the cabinet. All ground circuits shall be designed for a single path to the ground bar and no ground loops shall be created. The ground bus bar shall be a separate copper or brass multi-terminal bus bar. It shall be mounted directly to the panel and connected to chassis ground input terminal with a single #6 AWG green insulated wire. The bus bar shall be sized to accept 5 - #14 AWG solid wires at each terminal and shall have a minimum of 12 positions. This bus shall be used to terminate all the ground circuits from cable wired to the signal heads. All internal ground wiring to this bar shall be on one end using a maximum of 4 positions.

The power panel components for type 2 and 3 cabinets shall be incorporated on the back panel. Both neutral and ground bus bars shall be located conveniently for installing field wiring. All other requirement mentioned above shall be adhered to. Switches shall be located for easy reach and away from energized parts. (Details shown on drawing #18A-1.)

18.6.1 Control Switches

The following switches shall be located on the power panel and shall perform the functions listed below and labeled as shown:

a. Cabinet light - ON/OFF - this switch shall control the AC+ to the cabinet light specified elsewhere in this standard. For type 2, 3, and 4 cabinets the switch shall be part of the fixture.
b. Test - FLASH/AUTO - The "flash position" of this switch shall allow the signal indications to flash and the control equipment to cycle in its normal manner. The "auto" position will not affect the normal operation of the equipment.

18.6.2 Breakers

Breakers shall be provided in each type of cabinet. The AC+ power shall have one input and shall be bussed to three (3) separate circuits. The breakers shall be a single pole, molded case, screw mounted on this panel with two #10 screws on a four and one/half inch pattern. Each breaker shall indicate visually that the breaker has been tripped. The following are the functions and labels for each breaker:

a. Controller power - ON/OFF - this shall be rated for ten amps and control the AC+ power to the controller and conflict monitor. (filtered and suppressed)
b. Main Power - ON/OFF - this shall be rated for sixty amps and control the AC+ power into the cabinet for all equipment. The power for the auxiliary circuits shall not be controlled by this switch.
c. Detector Panel Power - ON/OFF - this shall be rated for ten amps and control the AC+ power to the detector panel used for interconnect relay outputs. This circuit shall not be used for detector card rack and shall not be connected to the suppressor on the power panel.
d. Auxiliary Power - ON/OFF - this shall be rated for twenty amps and control the AC+ power to the ventilation fan, cabinet light, and convenience outlet (filtered).

18.6.3 Surge Protection and Filtration

The power for the control equipment shall be protected by a RFI line filter and high voltage surge arresters. The line filter shall be rated at sixty amps on each AC+ and AC- line. Terminals on the filter shall be for suppression on the main power, neutral, and ground; and separate terminals for line in and out, neutral out supplying the controller and detector panel power to the breakers. The filter shall attenuate signals both from line to load and load to line. The attenuation in both directions shall be a minimum of 50 decibels over the frequency range of 200 KHz to 75 MHz. The impulse life of the protector shall be capable of operating 20 times at peak current. The clamp voltage shall be 340 volts at 20 Kamps and shall respond to over voltage conditions within 300 nanoseconds. The minimal capability of the protector shall be to discharge a single impulse with a wave shape of 8/20 and current to be 20 Kamps on each side to ground. The insulation resistance between line to ground shall be 100 megohms.

18.6.4 Signal Bus Operation

The signal bus power shall be switched individually by normally opened solid state relays rated a minimum of 60 amps, control voltage 120 VAC (Crydon series 1 - A2475 or equal). The solid state relay shall operate within the NEMA temperature range by derating the device and using necessary heat sinks. All switches are specified elsewhere and the circuit design shall limit the switched current to ten amps max.

18.6.5 Convenience Outlet

The receptacle shall be a feed through, ground fault interrupter type, 20 amps, duplex receptacle. The receptacle shall have three (3) wires from the device to the appropriate terminal on the power panel, (Ground, AC-, and AC+). The feed through shall supply power to the fan and light.

The convenience outlet installed in type 2 and 3 cabinets shall be mounted on the door. The electrical details shall meet the following requirements and details in drawing 18A-1. The convenience outlet in type 5 and above cabinets shall be mounted on the power panel.

18.6.6 Power Panel Isolation

A clear, non-breakable, 1/4" Lexan insulating cover shall be used to shield all open connections and not cover any switch, breaker levers, terminals blocks, bus bars, or convenience outlet. The cover shall be secured in place with screw fasteners and be removable by hand or simple hand tools.

18.7 DETECTOR AND AUXILIARY CONTROL PANELS

A detector panel shall be provided in cabinet types 3, 5, 6, and 7, and located on the left inside wall of the cabinet, except as noted for type 3 cabinet in section 18.7.2. The terminals and wires for detector card inputs, controller vehicle detector input test switches, remote communications, and additional functional inputs/outputs specified shall be on this panel. The upper portion of this panel shall be used for mounting any required terminal blocks. The middle of the panel shall be for vehicle/pedestrian test button and control circuit and field wiring terminals. A six position terminal block with suppressor shall be positioned on the bottom of the panel for communications. There shall be no splices in the wiring.

A separate panel shall be provided for the auxiliary controls including relay bases for interconnection controls, isolating the field circuits and the controller inputs.

18.7.1 Auxiliary Control Function (supplied with all Type 2 cabinets and when specified with any other cabinet.)

This panel shall be located on the left lower inside wall of all cabinets, below the detector panel when present, and shall be separate from other panels. Relay bases shall be mounted at the top of this panel and the quantity of bases shall be supplied that will provide the functions required or as indicated on the order. The relays bases shall be wired isolating the field wiring and the controller inputs/outputs for hardwired interconnect. Field wiring will be terminated at fuse blocks, specified elsewhere in this standard. Additional wiring requirements are given below. The relay bases shall be for two-pole octal relays and have screw terminals for all relay pins. The required functions for hardwired interconnect are; resets, cycles, splits, free, flash, and remote common. Wiring from the interconnect terminations described above shall not be included with any wiring or harnesses on the detector panel.

A terminal block shall be provided below the relay bases where the following are to be terminated. Power for this panel shall be supplied by a separate breaker on the power panel. A minimum of three adjacent positions shall be provided for each AC+, AC-, and ground. This power shall be used for supplying master interconnect power and providing power to external equipment. This power shall not be used for equipment power within the cabinet. Logic common from the controller shall also be terminated on a terminal strip. Controller system operations for dials 2, 3, and 4, split 2, 3, and 4, and offset 1, 2, 3, and 4, shall be terminated on the back panel as stated within this standard. Each system operation terminal shall be wired to the front side of the terminal blocks on the back panel and terminated using a compression spade lug to the inputs of the controller. Each wire shall be identified with a sleeve marked, D-2, D-3, D-4, SP-2, SP-3, SP-4, O-1, O-2, O-3, and O-4 respectively. Two terminal positions shall be provided for free in and out, and two positions for flash in and out. Wiring shall be provided for each, one for free and one for flash, from these terminals to the terminals on the front of back panel, terminated using compression spade lugs. Each identified with a sleeve, free marked FR and flash marked FL. This panel shall conform to drawing 18A of this standard.

(Engineering Note: For railroad preemption inputs, we intended to use the pedestrian isolator cards between field and controller inputs. For hardwired interconnect controls, we will move the wiring on the back panel for master or secondary operation. Similar methods of moving wires will be used to implement other required functions as needed.)

18.7.2 Detector Panel for Type 3 and 5 Cabinets

The detector panel shall be located on the inside right wall of type 3 cabinets and the left wall of type 5 cabinets. The panel shall have terminal positions for the specified field input circuits. The wiring

requirements stated above shall be followed. Terminals shall be provided for eight vehicle and four pedestrian detector input circuits.

The card rack shall follow the specified requirements elsewhere stated, however positions shall be provided for one power supply, two-four channel vehicle detector cards, and two pedestrian isolators cards. The wiring for the rack shall be formed to follow the hinge of the door without damage to the wiring.

18.7.3 Detector Panel Test Switches

Detector test switches shall be provided on all detector panels. These switches shall be positioned in between the terminal blocks for the field wiring and adjacent to the input of the channel that the switch is for. Access to the switches shall not be interfered with wires or suppressor. Each switch shall be a momentary push button, normally open switch. There shall be a switch for each detector channel supplied in the cabinet and for each pedestrian call circuit (2 for 4-phase, and 4 for 8-phase), as per this specification, order, plans, or any addendum. Each switch shall be permanently labeled with the nomenclature of the function it provides (∅ # or ∅ ##). The function of the switches shall be to place a logic ground on the controller vehicle, pedestrian, and system detector inputs. The wiring shall be terminated on the front of the back panel at the associated controller input terminal. A compression type spade lug shall be use and each wire marked with a identification sleeve as follows: VB-∅1, VB-∅2, . . . VB-∅8, PB-∅2, PB-∅4, etc.

18.7.4 Field Wiring - Detector and Auxiliary Panels

The loop lead-in, pedestrian field push button shall be terminated on the sides of the detector panel, the communications shall be terminated on the bottom of the detector panel, and the interconnect and field inputs/outputs shall be terminated on the bottom of the auxiliary panel. Each channel, vehicle and pedestrian, shall be terminated at two adjacent positions for inputs. On the auxiliary panel six NON type fuse holders and one remote common terminal shall be positioned on the bottom of the panel for hardwired interconnect.

The specified lightning protection shall be connected to the designated field terminals.

18.7.5 Communication Harnesses

All additional harnesses required for connecting the modem, line drivers, controller, master, and system hardware in addition to the specified connectors shall be provided and terminated in a fashion required by the manufacturer. Additional harnesses shall not negate any harness specific by this standard. Approval of these harnesses shall be obtained from the Department.

18.7.6 Lightning Protection

All detector and data field wiring shall be terminated on the required terminal block. Minimum voltage clamping shall be 30 volts for both differential and common mode. Current carrying capabilities shall be 400 amps in differential mode and 1000 amps in common mode. Response time for detector protection shall be 40ns and for data lines shall be 1 to 5 ns. The devices shall be mounted to the panel and the leads terminated on each field terminal.

All 120 volt field circuits shall be protected on the equipment side of the fuse by a surge protector. Operating line voltage shall be 120VAC, peak surge trip point for 600 volts/microsecond impulse shall be less than 890 volts. Response time shall be less the 200 nanosecond at 10KV/microsecond. Surge

handling ability shall be 20 Kamps. The device shall be mounted on the grounding stud adjacent to the protected terminal.

18.8 POLICE PANEL

The police panel shall be located in the police compartment previously specified and provide switches which are accessible when the police compartment door is opened. The following list of switches shall be located on this panel and be wired to their appropriate circuits to provide the functions identified below:

a. Flash Control Switch - Flash/Normal - this switch shall control the signal output from the controller to cause them to flash in the "Flash" position and to initialize the controller to the start-up phase unless the conflict monitor has detected a conflict. If the monitor has placed the equipment on flash, then this switch shall be inactive. The "Normal" position of the switch shall cause no effect to the signal circuits and shall allow the control equipment to function in its prescribed manner.

b. Signal Shut-Down - On/Off - the "On" position of this switch shall allow the signals to operate in normal manner. The "Off" position of the switch shall cause the signal indications to become dark, regardless of whether the signals were flashing or operating normally and to initialize the controller to the start up phase unless the conflict monitor has detected a conflict.

c. Manual Control - Auto/Manual - All necessary wiring, (manual control enable, interval advance, logic ground) shall be routed to the panel and terminated. A switch shall be provided only when specified and switch the function of the controller from normal operation in the "Auto" position to a manual advance operation in the "Manual" position by a manual push button to advance the controller in accordance with the NEMA standards. In addition to the switch, a manual control shall be provided. The cord shall be terminated on a terminal strip attached to the back of the police panel. The cord shall be weatherproof and coiled, having a maximum retracted length of eight inches and a minimum extended length of five feet. The cord shall be attached to the panel with a cable clamp, and fitted with strain relief bushing at the point it is routed through a five-eighths inch hole in the panel. The manual control shall be on the free end of the cord. The manual control and the connection to the cord shall be weatherproof. A hand grip shall be constructed for normal use by being held in one hand and a momentary contact switch can be activated with the thumb. This control shall be operable between the above mentioned lengths.

d. Emergency Vehicle Detection System Enable - On/Off - All necessary wiring shall be routed to the panel and terminated. A switch shall be provided to activate the EVDS when it is in the on position and the EVDS equipment is installed in the cabinet. In the off position the EVDS equipment shall be disabled and all functions connected to the Traffic Control System Equipment shall be disable allowing the control equipment to operate as programmed. When the EVDS equipment is not installed in the cabinet then this switch shall not effect the operation of the Traffic Control System Equipment.

The back of the panel shall have an aluminum shield to prevent personnel from accidentally coming in contact with the terminals of the switches or terminal strip. With the cover in place, it shall provide visual inspection of the back of the panel and shall not interfere with any equipment when the main door is closed.

19.0 CABINET WIRES AND WIRING

The wiring in the cabinet shall withstand the environmental temperature range as stated in NEMA TS-1. The insulation shall remain flexible over the temperature range and will not begin melting, causing the insulation to reduce in thickness. The insulation shall meet Specification MIL-W-16878D, 105 degrees, 600V, (MIL), heat resistant, polyvinylchloride or approved equal. The wire shall be 600 volts and color coded according to the following list:

HARNESS	COLOR
Controller harness and wiring	Blue
Conflict monitor Harness and wiring	Red
Detector, preemptor, and interconnect wiring	Yellow
All AC+	Black
All AC-	White
All Controller Logic Ground	White/Black Stripe or White/Green Stripe
All Chassis Ground	Green

TABLE 18A-12
WIRING COLOR CODE

The wire shall be stranded copper and sized to carry 125% of the design current and a minimum #22AWG. All signal circuit wiring shall meet the above stated size and be a minimum of #16AWG. All circuits shall be wired using a single conductor; therefore, parallel wiring is not an acceptable method of meeting wire size requirements as stated above. The wires shall be terminated individually by a solder less compression type spade lug appropriately sized or by soldering. All wiring shall be installed having a zero tension after installation.

Wire bundles shall be held in cable form by lacing tape, spiral wrap, or plastic sheathing. The lacing tape shall be flat, braided nylon and 0.090 inch wide, equal to ICO-Rally type LTN-2. The spiral wrap shall be correctly sized to fit the wire bundle and be a weather-resistant polyethylene equal to Panduit spiral wrapping. The insulating tubing shall be clear colored and sized to fit the wire bundle, equal to Alpha PVC-105 plastic tubing. Cable ties are restricted from use on cable bundles between panels and equipment harnesses. Cable ties may be used to bundle wire on panels only. Cable ties shall be self-locking and have properly applied tension according to the manufacturer's specifications. The ties shall be weather resistant nylon equal to T & B ties (MX series).

20.0 CABINET MECHANICAL AND ELECTRICAL HARDWARE

All hardware shall meet the environmental requirements of the controller. All fastening devices, (bolts, washers, screws, etc.), shall not rust when exposed to weather. These shall be hot dipped galvanized, stainless steel or brass. All electrical hardware shall be sealed and electrical contacts protected against moisture and corrosion.

20.1 TERMINAL BLOCKS

Terminal blocks shall be multiple terminal, one piece, rated at a minimum of 300 VDC for all 24 VDC control circuit terminations and a minimum of 600 VDC for all 120 VAC circuits. All field terminal blocks shall be multiple terminal, one piece, rated a 600 VDC and 20 amps. Exceptions to the above requirement for 600 VDC terminal blocks used with the 120 VAC terminations are the 120 VAC terminations of the controller, monitor, and detectors, which are permitted to be terminated on a 300 VDC terminal block. Another exception is where intermixing terminal blocks would result from the above requirement then the block to be used shall be determined by the voltage of the largest number of terminations on that block. The minimum current rating of all terminal blocks shall be 15 amps unless otherwise specified. The minimum amperage for the 120 VAC termination on the power panel shall be 60 amps. Any contradiction between circuit description and hardware restriction shall be resolved by using the larger requirement specified.

In addition to the above requirements for voltage terminations a minimum size screw shall be used. The terminal blocks shall have a minimum screw of #6 for low voltage circuits for the electronic equipment and #8 for all field termination. The power terminal shall be a barrel type screw tightened lug.

20.2 WIRING TERMINALS

All compression terminals shall be constructed with a base material of fine grade high conductive copper per QQ-C-576 and tin plated per MIL-T-10727 plating process for durable corrosion resistance against salt spray and most chemical fumes. The insulation shall be made of vinyl. The terminal shall be installed with tooling recommended by the manufacturer to meet the performance requirements of MIL-T-7928. The use of ring or spade terminals are not being precluded by the above requirement. Each terminal shall be correctly sized to fit the wire and terminal screw.

All soldered connections shall be made using the designed temperature for the solder being used and the location of the connection. The connection shall be made preventing a cold solder joint and excessive winking of the solder into the wire. The insulation of the wire shall not be damaged by excessive overheating at any point on the wire.

20.3 MULTIPLE PIN CONNECTORS

All multiple pin connectors shall be wired in accordance with the connector manufacturer's recommendations or applicable MIL specifications. The type of connector shall be in accordance with this standard, NEMA TS-2 TYPE 2, and as listed below.

Unused sockets and pins shall not be installed in the D connector. A cable clamp designed for each connector shall be installed securely to prevent excessive strain on the wires from being transmitted to the contacts inside the connector housing.

20.4 SWITCHES

All switches, except the detector push button test switches, shall be heavy duty toggle switches and meet the MIL-MS-35059 Series Standards, rated at 20 Amps/125 VAC. The level shall have a seal for sand, dust, and fifteen foot water submersion. The terminals shall be threaded for screws and have a tinned finish. Mounting shall be by two hex nuts and two internal-tooth, lock washers on a ½ inch shank through which the toggle lever is mounted. The number of poles and lever positions shall be determined by the applications previously stated.

20.5 LOAD CELL AND RELAY BASES

The load cell and the flash transfer relay sockets shall be rigidly mounted on the back panel. The insulating ridge on the front of the socket shall be reinforced with a metal mounting ring designed by the manufacturer of the socket. This ring shall be secured to the socket with a minimum of two screws and the ring fastened to the panel. Both sockets shall a minimum current rating of 15 amps, individual contacts, voltage rating of 1750 volts rms, pre-grounded, or grounding pin connected to chassis ground.

All relay bases used for special circuits specified previously, and not otherwise specified, shall be rated a 300 VDC and 10 Amps. Bases shall be front-panel mounted and shall have a closed back for insulation from the panel. The socket shall be octal and wired to barrier type terminals permanently numbered. Terminal screws shall be tinplated, #6-32 with captive nuts, and shall accept #20 to #12 AWG wire.

20.6 CABLE CLAMPS

All cable clamps shall have a metal loop and cushion made with a general purpose neoprene. The metal shall be aluminum 20204-T4 or stainless steel per Specification MIL-S-6721, annealed (321 or 347). The neoprene shall meet AMS Specification 3209. The clamp shall be sized to grip the cable it is being used on without damaging any insulation.

20.7 FUSES AND HOLDERS

All fuses located on the all removable electronic equipment shall be a 1/4 inch by 1-1/4 inch glass tube fuse rated at a minimum of 125 VAC. All panel mounted fuses shall be U.L. Class "H" fuses rated at 250 VAC, fast acting. Fuses shall be provided and equal to Type NON 0-30 Amps.

The fuse holder shall be constructed of a general purpose phenolic material U.L. listed for 250 VAC. The fuse holders shall have barriers on each side of the fuse and shall have a screw type terminal.

20.8 RELAY AND MOTOR SUPPRESSOR

A suppressor shall be installed on all AC relay coils and motor inputs. The suppressor shall be a series resistor-capacitor, 100 ohms-0.1 microfarad, and rated for 600 volts.

20.9 IDENTIFICATION SLEEVES

Identification sleeves shall be supplied on specified wires. The sleeve shall have the required identification printed or typed with a minimum size of pica-pitch 10. The sleeve shall be installed on the sire providing a self-laminating protective shield over the legend. Acceptable material shall be transparent 3.5 mil. vinyl film with acrylic pressure sensitive adhesive. The operating temperature range shall be -40° C to 80° C. The size of the label shall provide sufficient area for the printed identification.

Application of the sleeve onto the wire shall be neat and smooth completely protecting the identification label.

21.0 TESTING

A test(s) shall be performed on the cabinet containing the completely assembled equipment and control equipment by the manufacturer prior to shipment. Malfunctions or defects shall be corrected and

the equipment retested. The complete log beginning with the first test, showing the results of the all tests, shall be delivered with the equipment. The manufacturer shall furnish certification with the documentation required in section 24, stating that the results of the test are true and accurate and stating the name and title of the person conducting the test. The test shall require the operation of the equipment with each signal circuit connected to an incandescent load of at least six-hundred watts. The equipment shall operate sequentially and continuously for at least forty-eight hours, as stated above, in an environment having a minimum temperature of one-hundred-forty degrees Fahrenheit.

The complete system, including all local controllers, cabinets, on-street master controller, and modems shall be assembled and interconnected at the point of manufacture.

The system shall be completely performance tested and a written test report submitted in the documentation required in Section 24. The Engineer reserves the right to an on-site system inspection at the point of manufacture to witness the system operation and the performance test of the system.

After installation and debugging of all central control equipment, local controllers, detectors, communications, and other system hardware and software elements, the system shall be required to complete a 30 day period of acceptable operation. The system test shall fully and successfully demonstrate all system functions using live detector data and controlling all system-controlled intersections.

22.0 TRAINING

Formal classroom training and "hands-on" operations training shall be provided for personnel designated by this agency. The engineering, operations and maintenance training shall take place at locations within the state of Louisiana designated by this agency. The technician training shall take place at the manufacturer's facility. Classroom training shall be given for the engineering, operations and maintenance sessions.

Five training sessions are required during the contract period. Three maintenance sessions, one engineering session and one technician session shall be given. The engineering session shall provide for a maximum of twenty-five people. Each maintenance session shall provide for a maximum of fifteen people. The technician session shall provide for a maximum of four people. Copies of course materials shall be supplied to and retained by each attendant. Training shall occur after delivery of initial order, but before one year after date of final acceptance of initial order. The Manufacturer shall submit for each type of session, syllabuses to the Traffic Signal Engineer for approval before classes are scheduled.

22.1 OPERATIONAL TRAINING

Training for the operation of the system shall include analyzing system performance and revision of system operating parameters based on the analysis. The session shall be a minimum of two days and presented at an engineering level.

The training topics shall include as a minimum:

a. How to enter commands (, System software, utilities, and disk management)
b. Operation of all devices
c. Generation and editing of arterial master and intersection controller databases
d. Uploading/downloading of arterial master and intersection controller databases

e. Procedure for enabling dynamic displays
f. Explanation of the communication system

22.2 MAINTENANCE TRAINING

Training for maintenance personnel shall include detailed, field level troubleshooting and basic interrogation of the controller unit. The training shall consist of three sessions. Two sessions shall be remedial and one session shall cover more advanced material. Each session shall be three days in length. Course content shall emphasize information required to successfully pass the below specified tests.

Maintenance personnel shall be tested by the Vendor as to their ability to repair and/or diagnose simulated failures, and to gather basic information about a particular controller unit (i.e., min time, conflicting and non-conflicting phases, etc.). There shall be at least ten (10) controller/cabinet configurations per session type. Cabinets, controllers and miscellaneous materials shall be supplied by the Department. Wiring and programming necessary to conduct the tests shall be performed by the Vendor. The Vendor shall recommend at least ten (10) simulated failures, timing schemes and other configurations to be used for each type of test. The Department shall supply the Vendor with the final, approved test configurations, however, the Vendor shall not be required to perform more than six (6) hours of wiring or programming in development of the test configurations.

Final test questions shall be supplied by the Department. A Department representative will be present at all time to assist the Vendor in administering the test.

22.3 TECHNICIAN TRAINING

The manufacturer shall provide a minimum of two, four-day sessions at their facility for a maximum of three Department employees per session. The manufacturer shall be responsible for all costs associated with such training except for the cost of travel.

Training sessions shall be highly technical and include as a minimum the following topics:

a. Architecture of controller unit.
b. Controller troubleshooting to component level.
c. Cabinet wiring and troubleshooting
d. Advanced controller programming including diamond sequencing.

22.3 ENGINEERING TRAINING

Training for engineering personnel shall focus on implementing traffic engineering data with the controller. The manufacturer shall provide one two-day session for a maximum of 25 participants.

The first day of the session shall emphasize basic operation and interrogation of the controller. The second day of the session shall emphasize implementing traffic engineering data and include, at a minimum the following:

a. Programming an actuated, coordinated controller based on intersections provided by the Department.
b. Theory and operation of volume density operation and associated programming methods.
c. Theory and operation of three- and four-phase diamond sequencing and associated programming methods.

23.0 WARRANTY

The system equipment shall be warranted for a minimum of one year. All warranty periods shall begin at the date of acceptance by the Department.

24.0 DOCUMENTATION

Detailed technical information on material being offered shall be supplied with the bids for equipment directly shipped to the Department and with the material submittal for equipment being installed on projects. Information shall be for all items required by this specification and on the order or in the plans.

Manuals shall be supplied for all equipment and components of the system. The manuals supplied for software, peripherals, and modems shall be from the original source. The manual shall be comprehensive, easy to use and understand, and completely descriptive of the product.

24.1 CLOSED LOOP SYSTEM OPERATION MANUAL

a. Step-by-step system installation procedures
b. Operating instructions
c. System set-up procedures
d. Explanations and descriptions of data entry procedures
e. Menu item descriptions

24.2 EQUIPMENT MANUALS

a. Technical descriptions
b. Operating instructions
c. Theory of operation
d. Detailed schematic diagrams
e. Assembly drawings
f. Wiring diagram
g. Troubleshooting procedures to assist the maintenance staff in the identification and isolation of malfunctions
h. Parts list

24.3 CABINET WIRING

Complete wiring details shall be shown on the drawings. The drawings shall use the same nomenclature to identify the various components as referred to in this standard. If no name was mentioned in this standard then a reasonable nomenclature shall be used. A legend shall be provided on all drawings identifying acronyms and symbols. Two drawings shall be provided with each cabinet. The DOTD specification shall be followed when supplying documentation for projects.

FIGURES

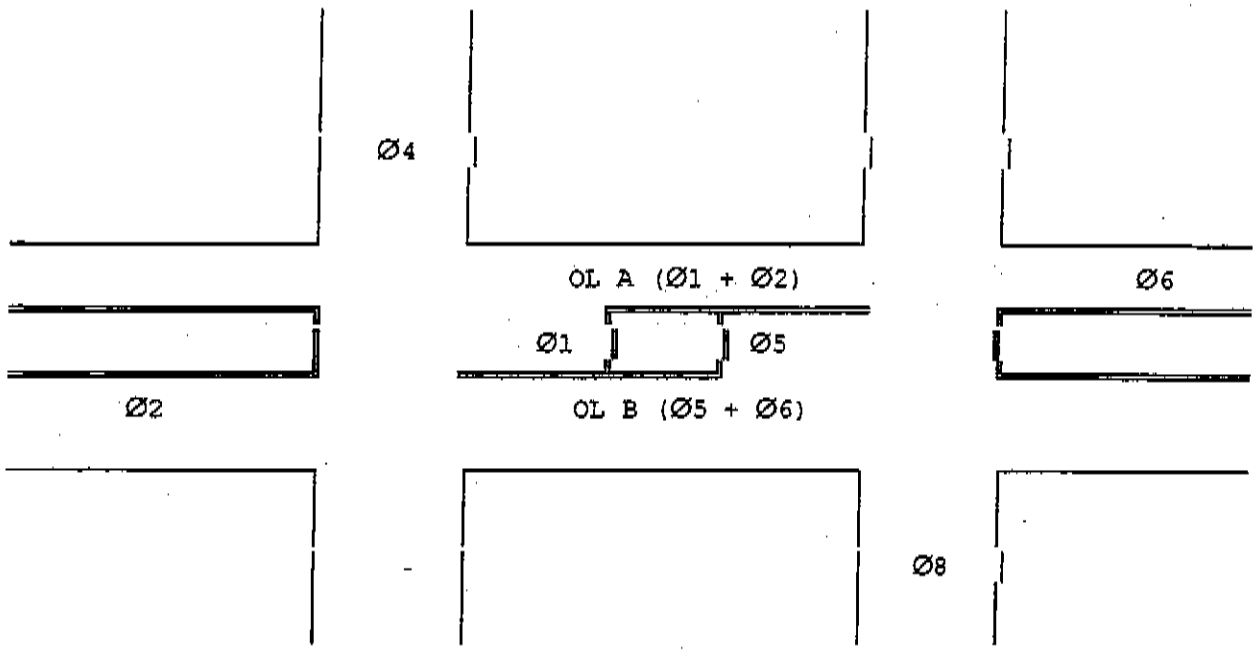


FIGURE 18A-3
DIAMOND INTERSECTION PHASE ASSIGNMENT

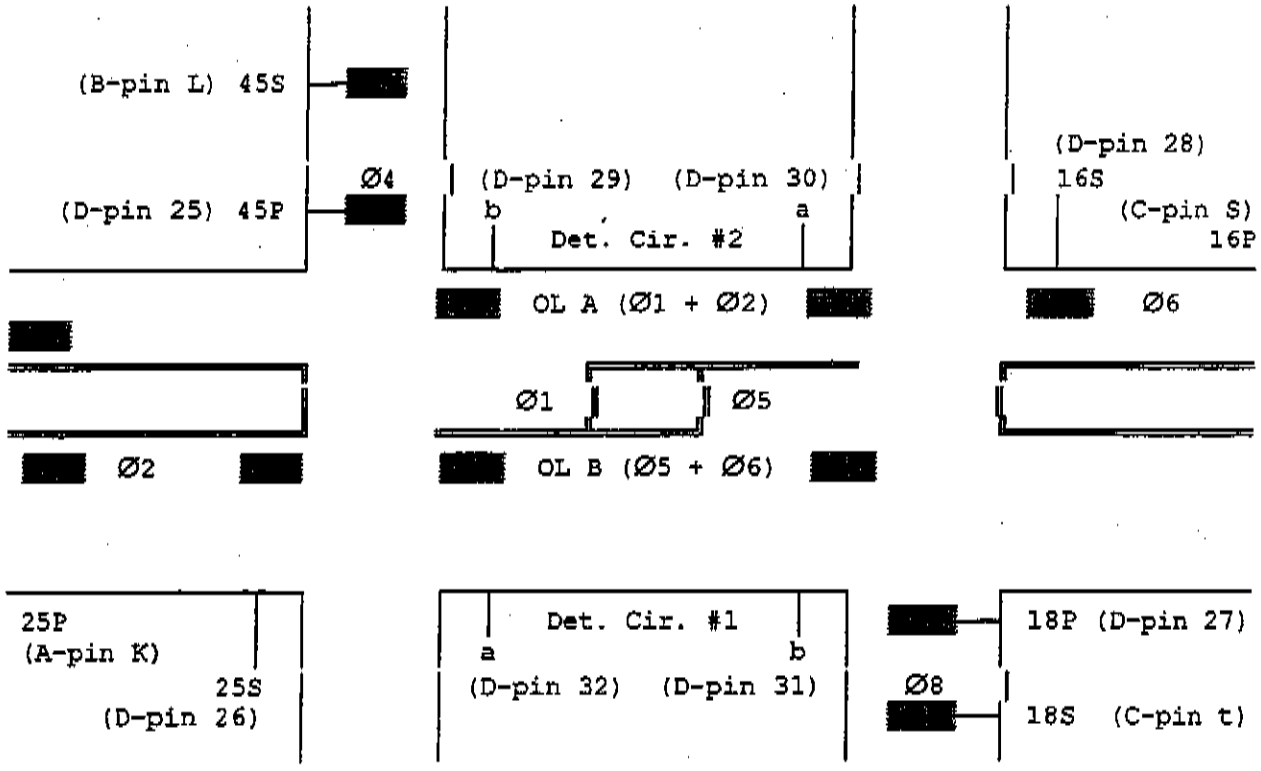


FIGURE 18A-4
VEHICLE DETECTOR ASSIGNMENT - 4 PHASE DIAMOND

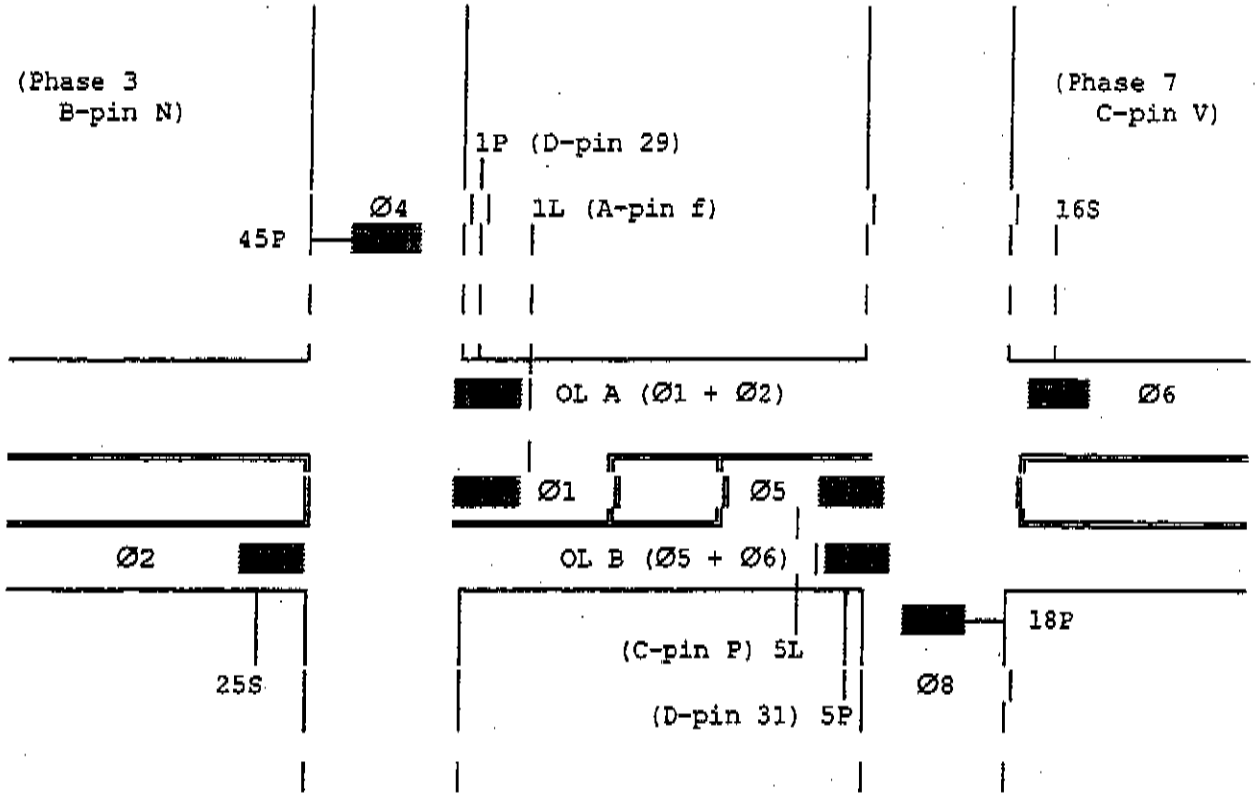


FIGURE 18A-5
VEHICLE DETECTOR ASSIGNMENT - 3 PHASE DIAMOND

APPENDIX

PIN/SOCKET ASSIGNMENTS FOR D CONNECTOR ON BACK PANEL

PIN	FUNCTION
1	OFFSET 1 IN
2	CYCLE 2 IN
3	CYCLE 3 IN
4	FLASH IN
5	OFFSET 2 IN
6	OFFSET 3 IN
7	INTERCONNECT FREE
8	SPLIT 2 IN
9	SPLIT 3 IN
10	SPL FUNCTION 2 OUT (TBC)
11	COMPUTER ON-LINE
12	THREE PHASE DIAMOND SELECT
13	FOUR PHASE DIAMOND SELECT
14	RESERVED
15	RESERVED
16	EXT RESYNC INPUT
17	MASTER SELECT
18	SYNC INPUT
19	PREEMPT 1 IN
20	PREEMPT 2 IN
21	PREEMPT 3 IN
22	PREEMPT 4 IN
23	PREEMPT 5 IN
24	PREEMPT INTERLOCK
25	SYSTEM DET. 1/DETECTOR 45P INPUT
26	SYSTEM DET. 2/DETECTOR 25S INPUT
27	SYSTEM DET. 3/DETECTOR 18P INPUT
28	SYSTEM DET. 4/DETECTOR 16S INPUT
29	SYSTEM DET. 5/DET. #2b-1P INPUT
30	SYSTEM DET. 6/DET. #2a INPUT
31	SYSTEM DET. 7/DET. #1b-5P INPUT
32	SYSTEM DET. 8/DET. #1a INPUT
33-34	SPARE
35	CONTROLLER INTERLOCK DIAMOND
36	COMP. SEL 1
37	COMP. SEL 2
38	COMP. SEL 3
39-41	SPARE (DO NOT USE)
42	CABINET INTERLOCK DIAMOND
43	SPL FUNCTION 1 OUT (TBC)
44	SPLIT 3 OUT
45	SPLIT 2 OUT
46	INTERCONNECT FREE OUT
47	OFFSET 3 OUT
48	OFFSET 2 OUT
49	FLASH OUT
50	CYCLE 3 OUT
51	CYCLE 2 OUT
52	OFFSET 1 OUT
53	+24 VDC
54	LOGIC GROUND
55	CHASSIS GND
56	RESERVED
57	RESERVED

PIN/SOCKET ASSIGNMENTS FOR E CONNECTOR ON BACK PANEL

PIN	FUNCTION
1	AC +
2	AC-
3	CHASSIS GROUND
9	PREEMPT 1
10	PREEMPT 2
11	PREEMPT 3
12	PREEMPT 4
13	PREEMPT 5
15	LOGIC GROUND

18A DRAWINGS

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

CONSTRUCTION PROPOSAL RETURNABLES FOR

STATE PROJECT NOS. 023-03-0013 AND 023-04-0030
DRY PRONG – WINN PARISH LINE
ROUTE US 167
GRANT AND WINN PARISHES

FOR INFORMATION ONLY

CONTRACT TIME FORM
COST-PLUS-TIME BIDDING PROCEDURE
(A + B) METHOD

STATE PROJECT NOS.	**023-03-0013 AND 023-04-0030**
FEDERAL AID PROJECT NO(S).	**N/A**
NAME OF PROJECT	**DRY PRONG – WINN PARISH LINE**
ROUTE	**US 167**
PARISHES	**GRANT AND WINN**

CONTRACT TIME

The bidder shall determine the number of calendar days required for completion and final acceptance of the project and shall state this required time, in words, in the space provided below. The maximum allowable contract time for this project is **eight hundred (800) calendar days**. The proposed completion time will be a factor used in considering bids for award of contract in accordance with the special provision, COST-PLUS-TIME BIDDING PROCEDURE (A+B METHOD). The stated number of calendar days required for completion will be the contract time for this project should the bidder be successful. Bids not including a contract time, or showing contract time in excess of the maximum allowable amount, will be considered irregular and will be rejected.

CONTRACT TIME **(Calendar Days To Completion, In Words)**
_____ Calendar Days

Form CS-01
A + B
12/04

BID BOND

A Proposal/Bid Guaranty is only required when the bidder's total bid amount as calculated by the Department in accordance with Subsection 103.01 is greater than $250,000. *(See Section 102 of the Project Specifications.)*

_____, as Principal
(Bidder)
and
_____, as Surety,
are bound unto the State of Louisiana, Department of Transportation and Development, (hereinafter called the Department) in the sum of five percent (5%) of the bidder's total bid amount as calculated by the Department for payment, of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, as solidary obligors.

Signed and sealed this _____ day of _____, 20____.

The condition of this obligation is such that, whereas the Principal has submitted a bid to the Department on a contract for the construction of **STATE PROJECT NOS. 023-03-0013 AND 023-04-0030, DRY PRONG – WINN PARISH LINE, located in GRANT AND WINN PARISHES, ROUTE US 167,** if the bid is accepted and the Principal, within the specified time, enters into the contract in writing and gives bond with Surety acceptable to the Department for payment and performance of said contract, this obligation shall be void; otherwise to remain in effect.

Principal (Bidder or First Partner to Joint Venture)	If a Joint Venture, Second Partner
By _____	By _____
Authorized Officer-Owner-Partner	Authorized Officer-Owner-Partner
_____	_____
Typed or Printed Name	Typed or Printed Name

Surety

By _____ (Seal)

Agent or Attorney-in-Fact

_____

Typed or Printed Name

To receive a copy of the contract and subsequent correspondence / communication from LA DOTD, with respect to the bid bonds, the following information must be provided:

Bonding Agency or Company Name	Address
Agent or Representative	Phone Number / Fax Number

05/02
Form CS-2A

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
SCHEDULE OF ITEMS

LEAD PROJECT: 023-03-0013
OTHER PROJECTS: 023-04-0030

DATE: 05/17/07 11:10 PAGE: 1

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
201-01	LUMP	LUMP SUM	CLEARING & GRUBBING _____ DOLLARS _____ CENTS
202-01	LUMP	LUMP SUM	REMOVAL OF STRUCTURES & OBSTRUCTIONS _____ DOLLARS _____ CENTS
202-02-D	9	SQUARE YARD	REMOVAL OF CONCRETE WALKS & DRIVES _____ DOLLARS _____ CENTS
202-02-G	3,275.8	SQUARE YARD	REMOVAL OF SURFACING & STABILIZED BASE _____ DOLLARS _____ CENTS
202-02-H	780	LINEAR FOOT	REMOVAL OF GUARD RAIL _____ DOLLARS _____ CENTS
202-02-I	8,860.4	SQUARE YARD	REMOVAL OF PAVED SHOULDERS _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
202-02-01	1	EACH	REMOVAL OF 326 SQ. FT. WOOD STORAGE BUILDING (LT. OF STA. 220+00.00) _____ DOLLARS _____ CENTS
202-02-02	1	EACH	REMOVAL OF 1,962 SQ. FT. BRICK RESIDENCE (LT. OF STA. 222+27.21) (CONTAINS NON-FRIABLE ASBESTOS) _____ DOLLARS _____ CENTS
202-02-03	1	EACH	REMOVAL OF 223 SQ. FT. BRICK STORAGE BUILDING (LT. OF STA. 222+47.21) (CONTAINS NON-FRIABLE ASBESTOS) _____ DOLLARS _____ CENTS
202-02-04	1	EACH	REMOVAL OF 1,249 SQ. FT. SWIMMING POOL (LT. OF STA. 223+00.00) _____ DOLLARS _____ CENTS
202-02-05	1	EACH	REMOVAL OF 30.0' x 28.0' WOOD RESIDENCE (LT. OF STA. 224+21.60) _____ DOLLARS _____ CENTS
202-02-06	1	EACH	REMOVAL OF 16.2' x 11.9' WOOD STORAGE BUILDING (LT. OF STA. 225+29.36) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
202-02-07	1	EACH	REMOVAL OF 2,481 SQ. FT. WOOD RESIDENCE (LT. OF STA. 227+08.31) _____ DOLLARS _____ CENTS
202-02-08	1	EACH	REMOVAL OF 572 SQ. FT. MOBILE HOME (LT. OF STA. 228+15.32) _____ DOLLARS _____ CENTS
202-02-09	1	EACH	REMOVAL OF 62.4' x 20.0' METAL BARN (LT.OF STA. 228+24.42) _____ DOLLARS _____ CENTS
202-02-10	1	EACH	REMOVAL OF 76.6' x 30.5' MOBILE HOME (LT. OF STA. 229+46.67) _____ DOLLARS _____ CENTS
202-02-11	1	EACH	REMOVAL OF 25.5' x 12.0' STORAGE BUILDING (LT. OF STA. 228+13.67) _____ DOLLARS _____ CENTS
202-02-12	1	EACH	REMOVAL OF 17.6' x 11.2' WOOD BUILDING (LT. OF STA. 266+92.32) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
202-02-13	1	EACH	REMOVAL OF 160 SQ. FT. WOOD BUILDING (LT. OF STA. 287+50.80) _____ DOLLARS _____ CENTS
202-02-14	1	EACH	REMOVAL OF 1,454 SQ. FT. WOOD RESIDENCE (LT. OF STA. 287+91.89) _____ DOLLARS _____ CENTS
202-02-15	1	EACH	REMOVAL OF 72.1' x 13.5' MOBILE HOME (LT. OF STA. 288+04.46) _____ DOLLARS _____ CENTS
202-02-16	1	EACH	REMOVAL OF 856 SQ. FT. WOOD BUILDING (LT. OF STA. 288+08.15) _____ DOLLARS _____ CENTS
202-02-17	1	EACH	REMOVAL OF 2,595 SQ. FT. BRICK RESIDENCE (LT. OF STA. 288+39.39) (CONTAINS FRIABLE ASBESTOS) _____ DOLLARS _____ CENTS
202-02-18	1	EACH	REMOVAL OF 2,017 SQ. FT. METAL BUILDING (LT. OF STA. 288+66.20) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
202-02-19	1	EACH	REMOVAL OF 638 SQ. FT. WOOD BUILDING (LT. OF STA. 295+30.00) _____ DOLLARS _____ CENTS
202-02-20	1	EACH	REMOVAL OF 960.5 SQ. FT. WOOD RESIDENCE (LT. OF STA. 296+13.14) (CONTAINS NON-FRIABLE ASBESTOS) _____ DOLLARS _____ CENTS
202-02-21	1	EACH	REMOVAL OF 35.0' x 13.7' WOOD SHED (RT. OF STA. 15+78.43-LA 472) _____ DOLLARS _____ CENTS
202-02-22	1	EACH	REMOVAL OF 16.2' x 10.0' METAL BUILDING (RT. OF STA. 15+91.39-LA 472) _____ DOLLARS _____ CENTS
202-02-23	1	EACH	REMOVAL OF 31.7' x 24.0' BUILDING (LT. OF STA. 17+46.33-LA 472) _____ DOLLARS _____ CENTS
202-02-24	1	EACH	REMOVAL OF 50.1' X 28.2' WOOD RESIDENCE (LT. OF STA. 731+24.05) (CONTAINS NON-FRIABLE ASBESTOS) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
202-02-25	1	EACH	REMOVAL OF 192 SQ. FT. METAL BUILDING (LT. OF STA. 731+25.00) _____ DOLLARS _____ CENTS
202-02-26	1	EACH	REMOVAL OF 192 SQ. FT. METAL BUILDING (LT. OF STA. 731+65.00) _____ DOLLARS _____ CENTS
202-02-27	1	EACH	REMOVAL OF 189 SQ. FT. METAL BUILDING (LT. OF STA. 732+05.00) _____ DOLLARS _____ CENTS
202-02-28	1	EACH	REMOVAL OF 373 SQ. FT. METAL BUILDING (LT. OF STA. 732+10.00) _____ DOLLARS _____ CENTS
202-02-29	1	EACH	REMOVAL OF 1,025 SQ. FT. WOOD BUILDING (LT. OF STA. 16+00.00-LEFT TURN MILITARY ROAD) _____ DOLLARS _____ CENTS
202-02-30	1	EACH	REMOVAL OF 47' x 1' CONCRETE RETAINING WALL (RT. OF STA. 375+25.87) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
202-02-31	1	EACH	REMOVAL OF PROPANE TANK (LT. OF STA. 732+42.82) _____ DOLLARS _____ CENTS
202-03-01	1	EACH	RELOCATION OF 12' X 6.5' CATTLE GUARD (LT. OF STA. 735+00.00) _____ DOLLARS _____ CENTS
202-03-02	1	EACH	RELOCATION OF 21' X 5' CATTLE GUARD (LT. OF STA. 738+78.44) _____ DOLLARS _____ CENTS
203-01	960,167	CUBIC YARD	GENERAL EXCAVATION _____ DOLLARS _____ CENTS
203-02	13,742	CUBIC YARD	DRAINAGE EXCAVATION _____ DOLLARS _____ CENTS
203-03	876,687	CUBIC YARD	EMBANKMENT _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
203-04-A	237	CUBIC YARD	NONPLASTIC EMBANKMENT (STONE) _____ DOLLARS _____ CENTS
203-08	1,520	SQUARE YARD	GEOTEXTILE FABRIC _____ DOLLARS _____ CENTS
204-02	448	EACH	TEMPORARY HAY OR STRAW BALES _____ DOLLARS _____ CENTS
204-03	586	LINEAR FOOT	TEMPORARY SLOPE DRAINS _____ DOLLARS _____ CENTS
204-05-A	475	EACH	TEMPORARY SEDIMENT CHECK DAMS (HAY) _____ DOLLARS _____ CENTS
204-05-B	555	EACH	TEMPORARY SEDIMENT CHECK DAMS (STONE) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
204-06	107,898	LINEAR FOOT	TEMPORARY SILT FENCING _____ DOLLARS _____ CENTS
204-07	2	EACH	TEMPORARY STONE CONSTRUCTION ENTRANCE _____ DOLLARS _____ CENTS
302-02-A-01	385,739.4	SQUARE YARD	CLASS II BASE COURSE (4" THICK) (STONE OR RECYCLED PCCP) _____ DOLLARS _____ CENTS
302-02-C-01	342,222.7	SQUARE YARD	CLASS II BASE COURSE (8" THICK) (SOIL CEMENT) _____ DOLLARS _____ CENTS
304-01	2,919.37	TON	LIME _____ DOLLARS _____ CENTS
304-04-D	205,952	SQUARE YARD	LIME TREATMENT (TYPE D) (12" THICK) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
401-01	9,828.1	CUBIC YARD	AGGREGATE SURFACE COURSE (NET SECTION) (SHOULDERS) _____ DOLLARS _____ CENTS
401-02	459	CUBIC YARD	AGGREGATE SURFACE COURSE (ADJUSTED VEHICULAR MEASUREMENT) (DRIVEWAYS) _____ DOLLARS _____ CENTS
402-01	10,000.0	CUBIC YARD	TRAFFIC MAINTENANCE AGGREGATE (VEHICULAR MEASUREMENT) _____ DOLLARS _____ CENTS
502-01	74,091.2	TON	SUPERPAVE ASPHALTIC CONCRETE _____ DOLLARS _____ CENTS
502-01-A	12,426.9	TON	SUPERPAVE ASPHALTIC CONCRETE, DRIVES, TURNOUTS AND MISCELLANEOUS _____ DOLLARS _____ CENTS
701-01-G	2,468	LINEAR FOOT	CROSS DRAIN PIPE (18" RCP/PCP) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
701-01-I	4,070	LINEAR FOOT	CROSS DRAIN PIPE (24" RCP/PCP) _____ DOLLARS _____ CENTS
701-01-K	1,208	LINEAR FOOT	CROSS DRAIN PIPE (30" RCP/PCP) _____ DOLLARS _____ CENTS
701-01-M	120	LINEAR FOOT	CROSS DRAIN PIPE (36" RCP/PCP) _____ DOLLARS _____ CENTS
701-01-N	1,544	LINEAR FOOT	CROSS DRAIN PIPE (42" RCP/PCP) _____ DOLLARS _____ CENTS
701-01-N-01	398	LINEAR FOOT	CROSS DRAIN PIPE (42" RCP)(CLASS IV CONCRETE) _____ DOLLARS _____ CENTS
701-01-O	624	LINEAR FOOT	CROSS DRAIN PIPE (48" RCP/PCP) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
701-01-P	610	LINEAR FOOT	CROSS DRAIN PIPE (54" RCP/PCP) _____ DOLLARS _____ CENTS
701-02-D	270	LINEAR FOOT	CROSS DRAIN PIPE ARCH (24" EQUIV. RCPA) _____ DOLLARS _____ CENTS
701-02-G	568	LINEAR FOOT	CROSS DRAIN PIPE ARCH (42" EQUIV. RCPA) _____ DOLLARS _____ CENTS
701-02-H	186	LINEAR FOOT	CROSS DRAIN PIPE ARCH (48" EQUIV. RCPA) _____ DOLLARS _____ CENTS
701-05-G	1,086	LINEAR FOOT	SIDE DRAIN PIPE (18") _____ DOLLARS _____ CENTS
701-05-G-01	179	LINEAR FOOT	SIDE DRAIN PIPE (18") (EROSION) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
701-10-I	178	LINEAR FOOT	REINFORCED CONCRETE PIPE (EXTENSION) (24") _____ DOLLARS _____ CENTS
701-10-K	12	LINEAR FOOT	REINFORCED CONCRETE PIPE (EXTENSION) (30") _____ DOLLARS _____ CENTS
701-15	1	EACH	CONCRETE COLLAR _____ DOLLARS _____ CENTS
702-02-B	2	EACH	MANHOLES (R-CB-11) _____ DOLLARS _____ CENTS
702-03-A	49	EACH	CATCH BASINS (CB-01) _____ DOLLARS _____ CENTS
702-03-B	17	EACH	CATCH BASINS (CB-02) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
702-05-A	29	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 24" RCP/PCP) _____ DOLLARS _____ CENTS
702-05-B	9	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 30" RCP/PCP) _____ DOLLARS _____ CENTS
702-05-C	2	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 36" RCP/PCP) _____ DOLLARS _____ CENTS
702-05-D	11	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 42" RCP/PCP) _____ DOLLARS _____ CENTS
702-05-E	6	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 48" RCP/PCP) _____ DOLLARS _____ CENTS
702-05-F	4	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 54" RCP/PCP) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
702-05-G	2	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 24" EQUIV. RCPA) _____ DOLLARS _____ CENTS
702-05-H	4	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 42" EQUIV. RCPA) _____ DOLLARS _____ CENTS
702-05-I	1	EACH	CROSS DRAIN END TREATMENT (1 BARREL, 48" EQUIV. RCPA) _____ DOLLARS _____ CENTS
702-07-A	3	EACH	CROSS DRAIN SAFETY END (TYPE 1) _____ DOLLARS _____ CENTS
704-03	1,825.5	LINEAR FOOT	BLOCKED OUT GUARD RAIL _____ DOLLARS _____ CENTS
704-06	37.5	LINEAR FOOT	GUARD RAIL ANCHOR SECTIONS (TRAILING END) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
704-08-B	200.0	LINEAR FOOT	GUARD RAIL TRANSITIONS (DOUBLE THRIE BEAM) _____ DOLLARS _____ CENTS
704-11-A	9	EACH	GUARD RAIL END TREATMENT (FLARED) _____ DOLLARS _____ CENTS
705-01	12,625	LINEAR FOOT	BARBED WIRE FENCE _____ DOLLARS _____ CENTS
705-04	1	EACH	SINGLE SWINGING DRIVEWAY GATE _____ DOLLARS _____ CENTS
706-03-C	1,076.2	SQUARE YARD	INCIDENTAL CONCRETE PAVING (6" THICK) _____ DOLLARS _____ CENTS
708-01	219	EACH	RIGHT-OF-WAY MONUMENT _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
708-02	219	EACH	RIGHT-OF-WAY MONUMENT WITNESS POST _____ DOLLARS _____ CENTS
711-01-D	24,428	SQUARE YARD	RIPRAP (55 LB, 18" THICK) _____ DOLLARS _____ CENTS
711-04	26,686	SQUARE YARD	GEOTEXTILE FABRIC _____ DOLLARS _____ CENTS
712-02	177	SQUARE YARD	SACKED CONCRETE REVETMENT _____ DOLLARS _____ CENTS
713-01	LUMP	LUMP SUM	TEMPORARY SIGNS & BARRICADES _____ DOLLARS _____ CENTS
713-03-B-01	0.426	MILE	TEMPORARY PAVEMENT MARKINGS (BROKEN LINE)(4" WIDTH)(10' LENGTH) (TYPE 1 REMOVABLE) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
713-04-E-01	0.134	MILE	TEMPORARY PAVEMENT MARKINGS (SOLID LINE) (24" WIDTH) (TYPE 1 REMOVABLE) _____ DOLLARS _____ CENTS
715-01	18,124	CUBIC YARD	TOPSOIL _____ DOLLARS _____ CENTS
720-01-A	77,245	SQUARE YARD	EROSION CONTROL SYSTEM, SLOPE PROTECTION (TYPE A) _____ DOLLARS _____ CENTS
720-01-B	48,460	SQUARE YARD	EROSION CONTROL SYSTEM, SLOPE PROTECTION (TYPE B) _____ DOLLARS _____ CENTS
720-01-C	2,329	SQUARE YARD	EROSION CONTROL SYSTEM, FLEXIBLE CHANNEL LINER (TYPE C) _____ DOLLARS _____ CENTS
720-01-D	10,332	SQUARE YARD	EROSION CONTROL SYSTEM, FLEXIBLE CHANNEL LINER (TYPE D) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
722-02	1	EACH	PROJECT SITE LABORATORY (EQUIPPED) _____ DOLLARS _____ CENTS
726-01	1,935.0	CUBIC YARD	BEDDING MATERIAL _____ DOLLARS _____ CENTS
727-01	LUMP	LUMP SUM	MOBILIZATION _____ DOLLARS _____ CENTS
729-16-C	8	EACH	OBJECT MARKER ASSEMBLY (TYPE 3) _____ DOLLARS _____ CENTS
729-19-A	1	EACH	DEAD END ROAD INSTALLATIONS(TYPE A) _____ DOLLARS _____ CENTS
731-02	6,188	EACH	REFLECTORIZED RAISED PAVEMENT MARKERS _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
732-02-A	62.828	MILE	PLASTIC PAVEMENT STRIPING (SOLID LINE) (4" WIDTH) _____ DOLLARS _____ CENTS
732-02-C	1.186	MILE	PLASTIC PAVEMENT STRIPING (SOLID LINE) (8" WIDTH) _____ DOLLARS _____ CENTS
732-02-E	0.179	MILE	PLASTIC PAVEMENT STRIPING (SOLID LINE) (24" WIDTH) _____ DOLLARS _____ CENTS
732-03-A	29.876	MILE	PLASTIC PAVEMENT STRIPING (BROKEN LINE) (4" WIDTH) _____ DOLLARS _____ CENTS
732-04-A	46	EACH	PLASTIC PAVEMENT LEGENDS & SYMBOLS (ARROW) _____ DOLLARS _____ CENTS
732-04-C	23	EACH	PLASTIC PAVEMENT LEGENDS & SYMBOLS (ONLY) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
732-04-D	1	EACH	PLASTIC PAVEMENT LEGENDS & SYMBOLS (RR CROSSING) _____ DOLLARS _____ CENTS
732-05	14.732	MILE	REMOVAL OF EXISTING MARKINGS _____ DOLLARS _____ CENTS
735-01	3	EACH	MAILBOXES _____ DOLLARS _____ CENTS
735-02	3	EACH	MAILBOX SUPPORTS (SINGLE) _____ DOLLARS _____ CENTS
736-01	825	LINEAR FOOT	TRENCHING AND BACKFILLING _____ DOLLARS _____ CENTS
736-04-A	4	EACH	SIGNAL SUPPORT (35' METAL STRAIN POLE) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
736-05-01	6	EACH	SIGNAL HEADS (1 SECTION, R 12" LED) _____ DOLLARS _____ CENTS
736-05-02	4	EACH	SIGNAL HEADS (1 SECTION Y 12" LED) _____ DOLLARS _____ CENTS
736-06	1	EACH	SIGNAL SERVICE _____ DOLLARS _____ CENTS
736-08	1	EACH	SIGNAL CONTROLLER _____ DOLLARS _____ CENTS
736-10-A	5	EACH	UNDERGROUND JUNCTION BOX (TYPE E) _____ DOLLARS _____ CENTS
736-10-B	1	EACH	UNDERGROUND JUNCTION BOX (TYPE H) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
736-11-A	790	LINEAR FOOT	CONDUIT (2" PVC) _____ DOLLARS _____ CENTS
736-11-B	35	LINEAR FOOT	CONDUIT (3" PVC) _____ DOLLARS _____ CENTS
736-12-A	335	LINEAR FOOT	CONDUCTOR (3C, #6 AWG, 600V, SERVICE) _____ DOLLARS _____ CENTS
736-12-B	170	LINEAR FOOT	CONDUCTOR (6C, #14 AWG, 600V) _____ DOLLARS _____ CENTS
736-12-C	1,450	LINEAR FOOT	CONDUCTOR (10C, #14 AWG, 600V) _____ DOLLARS _____ CENTS
739-01	47.05	ACRE	HYDRO-SEEDING _____ DOLLARS _____ CENTS

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ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
739-01-A	291.40	ACRE	HYDRO-SEEDING (US FOREST SERVICE) _____ DOLLARS _____ CENTS
740-01	LUMP	LUMP SUM	CONSTRUCTION LAYOUT _____ DOLLARS _____ CENTS
740-02	LUMP	LUMP SUM	UTILITY OVERSIGHT AND COORDINATION _____ DOLLARS _____ CENTS
802-01	228.9	CUBIC YARD	STRUCTURAL EXCAVATION _____ DOLLARS _____ CENTS
804-01-B	3,110	LINEAR FOOT	PRECAST CONCRETE PILES (14") _____ DOLLARS _____ CENTS
804-12	2	EACH	LOADING PERMANENT PILES _____ DOLLARS _____ CENTS

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ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
805-01-A	24.98	CUBIC YARD	CLASS A CONCRETE (PIPE HEADWALLS) _____ DOLLARS _____ CENTS
805-01-B	82.72	CUBIC YARD	CLASS A CONCRETE (BOX CULVERT HEADWALLS) _____ DOLLARS _____ CENTS
805-01-F	89.54	CUBIC YARD	CLASS A CONCRETE (BENTS) _____ DOLLARS _____ CENTS
805-03	315.75	CUBIC YARD	CLASS AA CONCRETE _____ DOLLARS _____ CENTS
805-12-B	609.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (4'X 4') _____ DOLLARS _____ CENTS
805-12-B-01	260.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (4'X 4') (CAST-IN-PLACE ONLY) _____ DOLLARS _____ CENTS

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
805-12-I-01	580.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (5'X 5')(CAST-IN-PLACE ONLY) _____ DOLLARS _____ CENTS
805-12-M	118.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (6'X 6') _____ DOLLARS _____ CENTS
805-12-M-01	1,015.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (6'X 6')(CAST-IN-PLACE ONLY) _____ DOLLARS _____ CENTS
805-12-Y	205.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (2'X 2') _____ DOLLARS _____ CENTS
805-12-Z	66.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (3'X 3') _____ DOLLARS _____ CENTS
805-12-Z-01	43.0	LINEAR FOOT	REINFORCED CONCRETE BOX CULVERTS (3'X 4') _____ DOLLARS _____ CENTS

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ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
806-01	84,638	POUND	DEFORMED REINFORCING STEEL _____ DOLLARS _____ CENTS
810-01	360.00	LINEAR FOOT	CONCRETE RAILING (32" BARRIER) _____ DOLLARS _____ CENTS
813-01	728.88	SQUARE YARD	CONCRETE APPROACH SLABS _____ DOLLARS _____ CENTS
S-001	10,463	LINEAR FOOT	FULL DEPTH SAWCUTTING _____ DOLLARS _____ CENTS
S-002	LUMP	LUMP SUM	REMOVAL OF S. P. NO. 023-04-0017 TRANSITION ROAD _____ DOLLARS _____ CENTS
S-003	29.5	MILE	RUMBLE STRIPS (GROUND-IN) _____ DOLLARS _____ CENTS

FOR INFORMATION ONLY

ITEM NUMBER	APPROXIMATE QUANTITY	UNIT OF MEASURE	PAY ITEM UNIT PRICE (IN WORDS, INK OR TYPED)
S-004	222	TON	OPEN GRADED FRICTION COURSE (LOW VOLUME TRAFFIC APPLICATIONS) _____ DOLLARS _____ CENTS
S-101	LUMP	LUMP SUM	RETROREFLECTIVE SHEETING PANELS _____ DOLLARS _____ CENTS

CONSTRUCTION PROPOSAL SIGNATURE AND EXECUTION FORM

THIS FORM, THE SCHEDULE OF ITEMS, AND THE PROPOSAL GUARANTY MUST BE COMPLETED AS INDICATED AND SUBMITTED TO THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT (DOTD) TO CONSTITUTE A VALID BID

STATE PROJECT NOS. **023-03-0013 AND 023-04-0030**

FEDERAL AID PROJECT NO(S). **N/A**

NAME OF PROJECT **DRY PRONG – WINN PARISH LINE**

I (WE) HEREBY CERTIFY THAT I (WE) HAVE CAREFULLY EXAMINED THE PROPOSAL, PLANS AND SPECIFICATIONS, INCLUDING ANY AND ALL ADDENDA, AND THE SITE OF THE ABOVE PROJECT AND AM (ARE) FULLY COGNIZANT OF ALL PROPOSAL DOCUMENTS, THE MASTER COPY OF WHICH IS ON FILE AT DOTD HEADQUARTERS IN BATON ROUGE, LA., AND ALL WORK, MATERIALS AND LABOR REQUIRED THEREIN, AND AGREE TO PERFORM ALL WORK, AND SUPPLY ALL NECESSARY MATERIALS AND LABOR REQUIRED FOR SUCCESSFUL AND TIMELY COMPLETION OF THE ABOVE PROJECT AND TO ACCEPT THE SUMMATION OF THE PRODUCTS OF THE UNIT PRICES BID ON THE SCHEDULE OF ITEMS ATTACHED HERETO AND MADE A PART HEREOF MULTIPLIED BY THE ACTUAL QUANTITY OF UNIT OF MEASURE PERFORMED FOR EACH ITEM, AS AUDITED BY DOTD, AS FULL AND FINAL PAYMENT FOR ALL WORK, LABOR AND MATERIALS NECESSARY TO COMPLETE THE ABOVE PROJECT, SUBJECT TO INCREASE ONLY FOR PLAN CHANGES (CHANGE ORDERS) APPROVED BY THE DOTD CHIEF ENGINEER OR HIS DESIGNEE. THIS BID IS SUBMITTED IN ACCORDANCE WITH THE GENERAL BIDDING REQUIREMENTS IN THE CONSTRUCTION PROPOSAL AND ALL SPECIAL PROVISIONS, PLANS, SUPPLEMENTAL SPECIFICATIONS, AND THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES (2006 EDITION). I (WE) UNDERSTAND THAT THE SUMMATION OF THE PRODUCTS OF THE UNIT PRICES BID ON THE SCHEDULE OF ITEMS MULTIPLIED BY THE ESTIMATED QUANTITY OF UNIT OF MEASURE FOR EACH ITEM, ALONG WITH ANY OTHER FACTORS SPECIFIED TO BE APPLICABLE SUCH AS CONSTRUCTION TIME AND/OR LANE RENTAL, SHALL BE THE BASIS FOR THE COMPARISON OF BIDS. I (WE) UNDERSTAND THAT THE SCHEDULE OF ITEMS MUST CONTAIN UNIT PRICES WRITTEN OUT IN WORDS AND THAT THE SCHEDULE OF ITEMS SUBMITTED AS PART OF THIS BID IS ON THE FORM SUPPLIED BY DOTD IN THE BID PROPOSAL. MY (OUR) PROPOSAL GUARANTY IN THE AMOUNT SPECIFIED FOR THE PROJECT IS ATTACHED HERETO AS EVIDENCE OF MY (OUR) GOOD FAITH TO BE FORFEITED IF THIS BID IS ACCEPTED BY DOTD AND I (WE) FAIL TO COMPLY WITH ANY REQUIREMENT NECESSARY FOR AWARD AND EXECUTION OF THE CONTRACT, AS WELL AS, SIGN AND DELIVER THE CONTRACT AND PAYMENT/PERFORMANCE/RETAINAGE BOND AS REQUIRED IN THE SPECIFICATIONS.

NONCOLLUSION DECLARATION (APPLICABLE TO FEDERAL-AID PROJECTS)

I (WE) DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES AND THE STATE OF LOUISIANA THAT I (WE) HAVE NOT DIRECTLY OR INDIRECTLY, ENTERED INTO ANY AGREEMENT, PARTICIPATED IN ANY COLLUSION, OR OTHERWISE TAKEN ANY ACTION IN RESTRAINT OF FREE COMPETITIVE BIDDING IN CONNECTION WITH THE CONTRACT FOR THIS PROJECT NOR VIOLATED LA. R.S. 48:254.

BIDDER'S DBE GOAL STATEMENT (APPLICABLE TO DBE GOAL PROJECTS)

IF THIS PROJECT IS DESIGNATED BY SPECIAL PROVISION AS A DISADVANTAGED BUSINESS ENTERPRISE (DBE) GOAL PROJECT IN ACCORDANCE WITH THE DBE PROVISIONS OF THIS CONTRACT, THE BIDDER ASSURES DOTD THAT HE/SHE WILL MEET OR EXCEED THE DBE CONTRACT GOAL, OR IF THE BIDDER CANNOT MEET THE REQUIRED DBE GOAL, THE BIDDER ASSURES DOTD THAT HE/SHE HAS MADE AND CAN DOCUMENT GOOD FAITH EFFORTS MADE TOWARDS MEETING THE GOAL REQUIREMENT IN ACCORDANCE WITH THE CONTRACT AND DBE PROGRAM MANUAL INCORPORATED HEREIN BY REFERENCE.

THE APPARENT LOW BIDDER SHALL COMPLETE AND SUBMIT TO THE DOTD COMPLIANCE PROGRAMS OFFICE, FORM CS-6AAA AND ATTACHMENT(S) AND, IF NECESSARY, DOCUMENTATION OF GOOD FAITH EFFORTS MADE BY THE BIDDER TOWARD MEETING THE GOAL, WITHIN TEN BUSINESS DAYS AFTER THE OPENING OF BIDS FOR THIS PROJECT. RESPONSIVENESS OF INFORMATION SUPPLIED IN THIS SECTION OF THIS CONSTRUCTION PROPOSAL SIGNATURE AND EXECUTION FORM IS GOVERNED BY THE DBE REQUIREMENTS INCLUDED WITHIN THE SPECIFICATIONS AND DBE PROGRAM MANUAL.

CERTIFICATION OF EMPLOYMENT OF LOUISIANA RESIDENTS TRANSPORTATION INFRASTRUCTURE MODEL FOR ECONOMIC DEVELOPMENT (TIME) PROJECTS (APPLICABLE TO TIME PROJECTS)

IF THIS PROJECT IS DESIGNATED BY SPECIAL PROVISION AS A TRANSPORTATION INFRASTRUCTURE MODEL FOR ECONOMIC DEVELOPMENT (TIME) PROJECT AS DEFINED IN ACT NO. 16 OF THE 1989 FIRST EXTRAORDINARY SESSION OF THE LEGISLATURE WHICH ENACTED PART V OF CHAPTER 7 OF SUBTITLE II OF TITLE 47 OF THE LOUISIANA REVISED STATUTES OF 1950, COMPRISED OF R.S. 47:820.1 THROUGH 820.6.

THE BIDDER CERTIFIES THAT AT LEAST 80 PERCENT OF THE EMPLOYEES EMPLOYED ON THIS TIME PROJECT WILL BE LOUISIANA RESIDENTS IN ACCORDANCE WITH LOUISIANA R.S. 47:820.3.

NON PARTICIPATION IN PAYMENT ADJUSTMENT (ASPHALT CEMENT AND FUELS) STATEMENT

IF THIS PROJECT IS DESIGNATED BY SPECIAL PROVISION AS BEING SUBJECT TO PAYMENT ADJUSTMENT FOR ASPHALT CEMENT AND/OR FUELS, THE BIDDER HAS THE OPTION OF REQUESTING EXCLUSION FROM SAID PAYMENT ADJUSTMENT PROVISIONS THAT ARE ESTABLISHED BY SPECIAL PROVISION ELSEWHERE HEREIN.

IF THE BIDDER DESIRES TO BE EXCLUDED FROM THESE PAYMENT ADJUSTMENT PROVISIONS,

THE BIDDER IS REQUIRED TO MARK HERE ☐

FAILURE TO MARK THIS BOX PRIOR TO BID OPENING WILL CONSTITUTE FORFEITURE OF THE BIDDER'S OPTION TO REQUEST EXCLUSION.

STATE PROJECT NOS. **023-03-0013 AND 023-04-0030**

BIDDER SIGNATURE REQUIREMENTS (APPLICABLE TO ALL PROJECTS)

THIS BID FOR THE CAPTIONED PROJECT IS SUBMITTED BY:

Name of Principal (Individual, Firm, Corporation, or Joint Venture)

If Joint Venture, Name of First Partner

(Louisiana Contractor's License Number of Bidder or First Partner to Joint Venture)

(Business Street Address)

(Business Mailing Address, if different)

(Area Code and Telephone Number of Business)

(Telephone Number and Name of Contact Person)

(Telecopier Number, if any)

If Joint Venture, Name of Second Partner

(Louisiana Contractor's License Number of Second Partner to Joint Venture)

(Business Street Address)

(Business Mailing Address, if different)

(Area Code and Telephone Number of Business)

(Telephone Number and Name of Contact Person)

(Telecopier Number, if any)

ACTING ON BEHALF OF THE BIDDER, THIS IS TO ATTEST THAT THE UNDERSIGNED DULY AUTHORIZED REPRESENTATIVE OF THE ABOVE CAPTIONED FIRM, CORPORATION OR BUSINESS, BY SUBMISSION OF THIS BID, AGREES AND CERTIFIES THE TRUTH AND ACCURACY OF ALL PROVISIONS OF THIS PROPOSAL, INCLUSIVE OF THE REQUIREMENTS, STATEMENTS, DECLARATIONS AND CERTIFICATIONS ABOVE AND IN THE SCHEDULE OF ITEMS AND PROPOSAL GUARANTY. EXECUTION AND SIGNATURE OF THIS FORM AND SUBMISSION OF THE SCHEDULE OF ITEMS AND PROPOSAL GUARANTY SHALL CONSTITUTE AN IRREVOCABLE AND LEGALLY BINDING OFFER BY THE BIDDER.

(Signature)

(Printed Name)

(Title)

(Date of Signature)

(Signature)

(Printed Name)

(Title)

(Date of Signature)

CONTRACTOR'S INFORMATIONAL BID

It is agreed that the total bid shown below, determined by the bidder, is for purposes of opening and reading bids only and that the low bidder for this project will be determined in accordance with the special provision entitled **COST-PLUS-TIME BIDDING PROCEDURE (A+B METHOD)**, as determined by the Department.

A = Summation of products of the quantities shown in the Schedule of Items multiplied by the unit prices.

A = _____

B = Bidders proposed contract time multiplied by the Daily User Cost ($4,200).

B = _____ Calendar Days x $4,200

B = _____

Contractor's Total Bid (A + B) _____