CONTRACT DOCUMENTS
AND TECHNICAL SPECIFICATIONS

2024 – LMIG ROAD IMPROVEMENTS

January 17, 2025

For The City of

GARDEN CITY, GEORGIA

GARDEN CITY

BRENNAN JONES ENGINEERING ASSOCIATES, LLC
7513 Mason Falls Drive, Winston, Georgia 30187
(P) 770.688.5148 - (F) 770.577.0300

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LIST OF DRAWINGS

PART 1 GENERAL

1.1 CONTRACT DRAWINGS

Contract drawings are as follows:

DRAWING NO.	TITLE	SHEET NAME	DATE
GENERAL			
1	COVER SHEET	G-001	1/17/2024
2	PROJECT LOCATION MAP, DRAWINGINDEX & GENERAL NOTES	G-002	1/17/2024
CIVIL			
3	DIVISION 1 RESURFACING PLAN	C-101	1/17/2024
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9	DIVISION 2 RESURFACING PLAN	C-107	1/17/2024
10	DIVISION 2 EXISTING & PROPOSED PAVEMENT CROSS SECTION GENERAL TRAFFIC CONTROL DETAIL	C-108	1/17/2024
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13	EROSION, SEDIMENTATION AND POLLUTION CONTROL NOTES & DETAILS - 2 OF 2	C-302	1/17/2024

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Document --

00 01 20

ADVERTISEMENT FOR BIDS

PART 1 GENERAL

City of Garden City
100 Central Avenue
Garden City, Georgia 31405

2024 LMIG ROAD IMPROVEMENTS

Garden City is seeking bids for two separate divisions of work as generally described below. Each division of work may be awarded separately.

Division I includes resurfacing of streets within the Chatham Villa Subdivision including Chatham Villa Drive, Byck Avenue, Olmstead Place, and Jasper Drive including approximately 6,675 linear feet (LF). The Work includes approximately 1,342 tons of asphalt pavement including milling, patching, placement of surface course, shoulder grading, temporary and permanent striping/marking, permanent grassing/stabilization, traffic control, and other related work.

Division II includes resurfacing of Salt Creek Road (from Pineland Drive to the dead end of Salt Creek Rd), including approximately 6,985 linear feet (LF). The Work includes approximately 1,265 tons of asphalt pavement including milling, patching, placement of surface course, shoulder grading, temporary and permanent striping/marking, permanent grassing/stabilization, traffic control, and other related work.

Separate sealed Bids for construction of the **2024 LMIG ROAD IMPROVEMENTS** will be received by the City of Garden City, Georgia (also referred to as Owner) from General Contractors, including all associated work labor and materials, equipment and appurtenances required to complete the work.

Bids will be received at the City of Garden City, 100 Central Avenue, Garden City, GA 31405, at 2:00 p.m. legal local time, Thursday, February 27, 2025 and then publicly opened and read aloud. Bids submitted by mail or courier are required to be delivered before the Bid Opening time stated above and should be addressed to City of Garden City, 100 Central Avenue, Garden City, Georgia 31405, Attention: Rhonda Ferrell-Bowles, City Manager.

No proposal will be considered unless it is accompanied by satisfactory evidence that the Bidder is pre-qualified with the Georgia Department of Transportation (GDOT) and has received a Certificate of Qualification in accordance with the rules and regulations approved and adopted by the State of Georgia Transportation Board. Bidder must provide evidence of compliance with this requirement.

No bid may be modified, withdrawn, or canceled for a period of sixty (60) days after time designated for receipt of Bids or until notified by Owner, whichever is sooner.

Bids must be accompanied by a certified check or Bid Bond in the amount of five percent of the bid amount. The successful bidder must be able to

provide a Payment Bond and Performance Bond within ten days of Notice of Award. The Payment Bond and Performance Bond must be in the amount of 100 percent of the contract amount.

A non-collusion affidavit must be completed and submitted as part of the Contractor's bid.

City of Garden City, Georgia reserves right to reject any and all bids and to waive irregularities, technicalities, and informalities.

The Contract Documents may be examined at the following locations:

City of Garden City
100 Central Avenue
Garden City, GA 31405
http://www.gardencity-ga.gov/for-business/bids-proposals

Brennan Jones Engineering Associates, LLC
7513 Mason Falls Drive
Winston, GA 30187

Dodge Data Analytics
www.Construction.com

Constructconnect
www.ConstructConnect.com
Phone (800) 364-2059

Electronic Bid packages consisting of plans and specifications may be obtained at the office of Brennan Jones Engineering Associates, LLC, the Engineer, upon written request. All technical questions regarding this solicitation should be directed to the Engineer at brennanjones@comcast.net or (770)688-5148.

S/ Rhonda Ferrell-Bowles, City Manager
City of Garden City
January 24, 2025

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 01 30

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 DEFINED TERMS

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions.

Certain additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.

a. Bidder: One who submits a Bid directly to Owner as distinct from a sub-bidder, who submits a bid to a Bidder.

b. Issuing Office: The (Engineer) office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

c. Successful Bidder: The lowest, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

1.2 COPIES OF BIDDING DOCUMENTS

a. Complete sets of the Bidding Documents may be obtained from the Office of the Engineer, Brennan Jones Engineering Associates, LLC. Bidding Documents are open for inspection to prospective bidders at the Issuing Office for the purpose of review in order to determine if the prospective bidders wish to obtain Bidding Documents.

b. Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents, whether obtained from the Owner, Engineer, Issuing Office, or other sources.

c. Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

1.3 QUALIFICATIONS OF BIDDERS

a. Before submitting a bid , the bidder shall have pre-qualified with the Georgia Department of Transportation (GDOT) and received a Certificate of Qualification in accordance with the rules and regulations approved and adopted by the State of Georgia Transportation Board. Bidder to provide evidence of compliance with this requirement. Failure of Bidder to provide such informaiton if requested, within 10 days of notification of request, shall be grounds for forfeiting of the bid security of that Bidder.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

a. It is the responsibility of each Bidder before submitting a Bid:

1. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents including "technical data" referred to below;

2. To consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work;

3. To study and carefully correlate Bidder's knowledge and observations with the Contract Documents and such other related data; and

4. To promptly notify Engineer of all conflicts, errors, ambiguities or discrepancies which Bidder has discovered in or between the Contract Documents and such other related documents.

b. Reference is made to the Supplementary Conditions for identification of:

1. Those reports of explorations and tests of subsurface conditions at or contiguous to the site which have been utilized by Engineer in preparation of the Contract Documents, (if any). Bidder may rely upon the general accuracy of the "technical data" contained in such reports but not upon other data, interpretations, opinions or information contained in such reports or otherwise relating to the subsurface conditions at the site, nor upon the completeness thereof for the purposes of bidding or construction.

2. Those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the site that have been utilized by Engineer in preparation of the Contract Documents, (if any). Bidder may rely upon the general accuracy of the "technical data" contained in such drawings but not upon other data, interpretations, opinions or information shown or indicated in such drawings or otherwise relating to such structures, nor upon the completeness thereof for the purposes of bidding or construction.

3. Copies of such reports and drawings, (if any), will be made available for review to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph "Subsurface and Physical Conditions" of the General Conditions. Bidder is responsible for any interpretation or conclusion drawn from any "technical data" or any such data, interpretations, opinions or information.

c. Information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities or others, and Owner and Engineer do not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

d. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in Paragraphs "Subsurface and Physical Conditions", "Differing Subsurface or Physical Conditions" and "Underground Facilities" of the General Conditions.

e. Before submitting a Bid each Bidder will be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise, which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

f. On request, Owner will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. Bidder must fill all holes and clean up and restore the site to its former conditions upon completion of such explorations, investigations, tests and studies.

g. Reference is made to the Supplementary Conditions for the identification of the general nature of work that is to be performed at the site by Owner or others (such as utilities and other prime contractors) that relates to the work for which a Bid is to be submitted. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such work.

h. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Paragraph "EXAMINATION OF CONTRACT DOCUMENTS", that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities and discrepancies that Bidder has discovered in the Contract Documents and the written resolutions thereof by Engineer is acceptable to Bidder, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

i. The provisions of Paragraph "EXAMINATION OF CONTRACT DOCUMENTS AND SITE" Subparagraphs a through h, of these Instructions To Bidders, inclusive, do not apply to Hazardous Environmental Conditions covered by Paragraph "Hazardous Environmental Condition at Site" of the General Conditions.

1.5 AVAILABILITY OF LANDS FOR WORK, ETC.

The lands upon which the Work is to be performed include: facility site,

rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by the Contractor. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by the Owner unless otherwise provided in the Contract Documents.

a. The site is located in a residential areas and within public road rights of way located within the Chatham Villa subdivision (Chatham Villa Drive, Byck Avenue, Olmstead Place, and Jasper Drive) and on Salt Creek Rd, Garden City, Georgia. Contractor is responsible for maintaining traffice and access for residents in the work area while Work is being performed.

1.6 INTERPRETATIONS AND ADDENDA

a. All questions about the meaning or intent of the Bidding Documents are to be directed to Engineer. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than five days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

b. Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

c. Failure of any Bidder to receive any such addendum or interpretations shall not relieve such bidder from any obligations under his Bid as submitted.

d. Failure of any Bidder to acknowledge any such addendum or interpretations shall not relieve such Bidder from any obligation under his Bid as submitted, if Bidder has knowledge of any such addendum, or interpretations. If Bidder has knowledge of any such addendum or interpretation but fails to acknowledge, this will be considered a formality.

1.7 BID SECURITY

a. Each Bid must be accompanied by a Bid Bond on the form attached with good and sufficient surety or sureties approved by the owner and meeting the requirements of Paragraph "Performance, Payment, and Other Bonds" of the General Conditions, for faithful acceptance of the contract, payable to, in favor of, and for the protection of the OWNER in an amount equivalent to five percent of the total amount payable by the terms of the contract, in lieu thereof, in the form of a certified check, cashier's check, or cash in equal amount. Bidders who submit Bid Security in the form of a certified check, cashier's check, or cash are bound by the "Terms of Bid Bond" as if submitted on the attached "Bid Bond" form.

b. The Bid security of Successful Bidder will be retained until such Bidder has executed the Agreement, furnished the required contract security and Certifications of Insurance and met the other conditions

of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within ten days after the Notice of Award, Owner may annul the Notice of Award and Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the 60th day after the Bid opening whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within 10 days after the Bid opening, if requested by the Respective Bidder.

1.8 CONTRACT TIMES

The number of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment are set forth in the Agreement and incorporated therein by reference in the attached Bid Form.

1.9 LIQUIDATED DAMAGES

Provisions for liquidated damages are set forth in the Agreement.

1.10 SUBCONTRACTORS, SUPPLIERS AND OTHERS

a. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening submit to Owner a list of all such Subcontractors, Suppliers and other persons and organizations proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization if requested by Owner. An Owner or Engineer who after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, may before the Notice of Award is given request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, that Bidder's price will be increased (or decreased) by the difference in cost occasioned by such substitution and Owner may consider such price adjustment in evaluating Bids and making the contract award.

b. If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph "Concerning Subcontractors, Suppliers, and Others" of the General Conditions.

1.11 BID FORM

a. The Bid Form is included with the Bidding Documents; additional copies may be obtained from the Engineer.

b. All blanks on the Bid Form must be completed by printing in ink or by typewriter.

c. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

d. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

e. All names must be typed or printed in ink below the signature.

f. The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).

g. The address and telephone number for communications regarding the Bid must be shown.

h. Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed shall be provided in accordance with Paragraph "QUALIFICATIONS OF BIDDERS" of these Instructions To Bidders. State contractor license number must also be shown.

i. Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form. Any bid which is not properly prepared and accompanied by required certifications and affidavits may be rejected by the Owner.

1.12 SUBMISSION OF BIDS

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, state contractor license number (if applicable) and accompanied by the Bid security, entire bidding documents, except drawings, and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

1.13 MODIFICATION OF BIDS

a. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that Bid must be executed) and delivered to

the place where Bids are to be submitted at any time prior to the receiving time.

1.14 OPENING OF BIDS

Bids will be opened and (unless obviously non-responsive) read aloud publicly at the place where Bids are to be submitted. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the effective date of the Contract.

a. The Owner is not obligated to consider a Bidder's proposal, if Bidder is not on record with the Engineer as having received complete Bidding Documents from the Engineer.

b. No bid shall be considered unless a proper bid bond or other security authorized in Paragraph "BID SECURITY" of these Instructions To Bidders is submitted.

1.15 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids will remain subject to acceptance for sixty days after the day of the Bid opening, but Owner may, in its sole discretion, release the Bid and return the Bid security prior to that date.

1.16 AWARD OF CONTRACT

a. Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Owner also reserves the right to waive all informalities not involving price, time or changes in the Work and to negotiate contract terms with the successful Bidder. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

b. In evaluating Bids, Owner will consider the qualifications of Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award. Conditional Bids will not be accepted.

c. Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

d. Owner may conduct such investigations as Owner deems necessary to

assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

e. Owner intends to award both Division I and Division II Work to separate contractors. The Owner reserves the right to reduce the project scope and Work associated with Division II by awarding or not awarding any or all project areas of Division II work in order to reduce the contract amount to the available budget.

f. If the contract is to be awarded, it will be awarded to the Bidder that submits the lowest responsive and responsible bid and whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project. No portion of the project will be awarded to separate bidders. Responsiveness shall be defined by: completeness and regularity of Bid Form, and a bid form without exclusions or special conditions. Responsibility will be based on whether the Bidder involved: maintains a permanent place of business, has documented experience with the type of work to be performed, has suitable financial status to meet obligations incident to the work, and Georgia DOT prequalification.

g. If the contract is to be awarded, Owner will give Successful Bidder a Notice of Award within 60 days after the day of the Bid opening.

1.17 CONTRACT SECURITY

The General Conditions and the Supplementary Conditions set forth Owner's requirements as to Performance and Payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Performance and Payment Bonds on the forms included in the Contract Documents.

1.18 SIGNING OF AGREEMENT

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and Certification of Insurance. Within ten days thereafter Owner shall deliver one fully signed counterpart to Contractor. Each counterpart is to be accompanied by a complete set of the Drawings and applicable documents with appropriate identification.

1.19 LAWS AND REGULATIONS

All applicable federal and state laws, municipal ordinances, and rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 41 13

BID FORM

PART 1 GENERAL

1.1 PROJECT IDENTIFICATION

2024 LMIG Road Improvements

1.2 THIS BID IS SUBMITTED TO:

City of Garden City
100 Central Avenue
Garden City, Georgia 31405

a. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to furnish all necessary products, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the Work in full and complete accordance with the reasonably intended requirements of the Contract Documents to the full and entire satisfaction of the Owner with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents, for the following Unit Prices and Bid Amount:

Unit Price Bid: Division I Chatham Villa Subdivision (Chatham Villa Drive, Byck Avenue, Olmstead Place, and Jasper Drive) BID:

Item No.	Description	Unit	Est. Qty.	Unit Price	Amount
1	Traffic Control (150-1000)	LS	1	$_____ Dollars & Cents	$_____ Amount
2	Grading Complete, incl. providing suitable fill material and Earthwork (210-0100)	LF	6,675	$_____ Dollars & Cents	$_____ Amount
3	Recycled Asph. Conc. Patching, Incl. Bitu. Matl., & H. Lime (402-1802)	Ton	100	$_____ Dollars & Cents	$_____ Amount

Item No.	Description	Unit	Est. Qty.	Unit Price	Amount
4	Recycled Asph. Conc. 9.5 mm SP, 150 LB/SY TP 1 GP 1 or 2, Incl. Bitu. Matl., & H. Lime (402-3100)	Ton	1,242	$_____ Dollars & Cents	$_____ Amount
5	Bituminous Tack Coat (413-1000)	Gal	755	$_____ Dollars & Cents	$_____ Amount
6	Mill Asphaltic Concrete Pavement 1.5 IN Depth (432-0206)	SY	15,015	$_____ Dollars & Cents	$_____ Amount
7	Adjust Manhole to Grade (Paved Areas)(611-8050)	EA	6	$_____ Dollars & Cents	$_____ Amount
8	Adjust Water Valve Box to Grade (Paved Areas)(611-8050)	EA	1	$_____ Dollars & Cents	$_____ Amount
9	Thermoplastic Solid Traf Striping, Yellow, 5" (653-1502)	LF	100	$_____ Dollars & Cents	$_____ Amount
10	Permanent Grassing Complete (700-0200)	LS	1	$_____ Dollars & Cents	$_____ Amount
11	Speed Bump Removal	EA	12	$_____ Dollars & Cents	$_____ Amount

Division I Chatham Villa Subdivision (Chatham Villa Drive, Byck Avenue, Olmstead Place, and Jasper Drive) Unit Price Bid, Item No. 1 through 11.

Total Amount:

_____

_____($_____)

(words and figures)

Unit Price Bid: Division II Salt Creek Road BID:

Item No.	Description	Unit	Est. Qty.	Unit Price	Amount
1	Traffic Control (150-1000)	LS	1	$_____ Dollars & Cents	$_____ Amount
2	Grading Complete, incl. providing suitable fill material and Earthwork (210-0100)	LF	6,985	$_____ Dollars & Cents	$_____ Amount
3	Recycled Asph. Conc. Patching, Incl. Bitu. Matl., & H. Lime (402-1802)	Ton	100	$_____ Dollars & Cents	$_____ Amount
4	Recycled Asph. Conc. 9.5 mm SP, 150 LB/SY TP 1 GP 1 or 2, Incl. Bitu. Matl., & H. Lime (402-3100)	Ton	1,265	$_____ Dollars & Cents	$_____ Amount
5	Bituminous Tack Coat (413-1000)	Gal	765	$_____ Dollars & Cents	$_____ Amount
6	Mill Asphaltic Concrete Pavement 1 IN Depth (432-0206)	SY	15,300	$_____ Dollars & Cents	$_____ Amount
7	Thermoplastic Solid Traf Striping, White, 5" (653-1501)	LF	13,970	$_____ Dollars & Cents	$_____ Amount
8	Thermoplastic Solid Traf Striping, Yellow, 5" (653-1502)	LF	13,970	$_____ Dollars & Cents	$_____ Amount

Item No.	Description	Unit	Est. Qty.	Unit Price	Amount
9	Permanent Grassing Complete (700-0200)	LS	1	$_____ Dollars & Cents	$_____ Amount

Division II Salt Creek Road Unit Price Bid, Item No. 1 through 9.

Total Amount:

_____

_____($_____)

(words and figures)

b. BIDDER accepts all of the terms and conditions of the Advertisement for Bidders and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for sixty days after the day of Bid opening. BIDDER will sign and deliver the required number of counterparts of the Agreement with the Bonds, Certifications of Insurance, and other documents required by the Bidding Requirements within ten days after the date of OWNER's Notice of Award.

c. In submitting the Bid, BIDDER represents, as more fully set forth in the Agreement, that:

1. BIDDER has examined and carefully studied the Bidding Documents and the following Addenda, receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date)

_____

_____

_____

_____

2. BIDDER declares an understanding that the quantities shown for unit price items are subject to either increase or decrease, and that should the quantities of any of the items of Work be increased, the BIDDER proposes to do the additional Work at the unit prices stated herein; and should the quantities be decreased, the BIDDER also understands that payment will be made on the basis of actual quantities at the unit price bid and will make no claim for additional costs or anticipated profits for any decrease in quantities; and that actual quantities will be determined upon completion of Work, at which time adjustment will be made to the Contract amount by direct increase or decrease;

3. In case of discrepancies between the figures shown in the unit prices and the totals, the unit prices shall apply and the totals shall be corrected to agree with the unit prices. In case of discrepancies between written amounts and figures, written amounts shall take precedence over figures and the sum of all Bid extensions (of unit prices) plus lump sum items shall take precedence over BID TOTAL;

4. BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work;

5. BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

6. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise

which may affect cost, progress, performance or furnishing of the Work or which relates to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.

7. BIDDER is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.

8. BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

9. BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

10. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

d. BIDDER agrees that the Work will be substantially complete within 60 days after the date when the Contract Times commences to run as provided in the General Conditions, and completed and ready for final payment in accordance with the General Conditions within 75 days after the date when the Contract Times commences.

e. BIDDER will complete the Work in accordance with the Contract Documents and in accordance with the scheduled times shown in paragraph d. of this Bid Form.

f. BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the time(s) specified in the Agreement.

g. The following documents are attached to this Bid:
   1. Required Bid Security in the form of Bid Bond, Certified Check, Cashier's Check, or Cash. Bidders who submit Bid Security in the form of a Certified check, Cashier's Check, or Cash are bound by the "Terms of Bid Bond" as if submitted on the attached "Bid Bond" form.
   2. Noncollusion Affidavit.

3. Statement of Bidder's Qualifications.

j. Communications concerning this Bid shall be addressed to:
Brennan D. Jones, P.E.
Brennan Jones Engineering Associates, LLC
7513 Mason Falls Dr.
Winston, Georgia 30187
Phone: (770)688-5148
Fax: (770)577-0300

The address of BIDDER indicated below.

BIDDER'S NAME
_____

Primary Contact Person
_____

Secondary Contact Person
_____

Bidder's Street Address
_____

_____

_____

Bidder's Mailing Address
_____

(if different)
_____

Bidder's Phone #
_____

Bidder's Fax #
_____

Georgia DOT Qualified Contractor No.*
_____

* Note: Required - Any bid not identified by correct license number will be considered incomplete & will not be accepted.)

h. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions or Instructions.

THIS BID SUBMITTED on _____, 20_____.If Bidder is:

An Individual

By _____ (SEAL)
(Individual's Name)

doing business as_____

Business address:_____

Phone Number: _____

A Partnership

By _____ (SEAL)
(Firm Name)

_____
(General Partner)

Business address:_____

_____

Phone Number: _____

A Corporation

By _____ (SEAL)
(Corporation Name)

_____
(State of Incorporation

By _____ (SEAL)
(Name of Person Authorized to Sign)

_____
(Title)
(Corporate Seal)

Attest_____

Business address:_____

_____

Phone Number: _____

Date of Qualification to do business is_____

PART 2 PRODUCTS
Not Applicable
PART 3 EXECUTION
Not Applicable

-- End of Section --

00 43 13

BID BOND

PART 1 GENERAL

PENAL SUM FORM

BIDDER: (Name and Address)

_____

_____

_____

SURETY: (Name and Address of Principal Place of Business)

_____

_____

_____

OWNER:
City of Garden City
100 Central Avenue
Garden City, Georgia 31405

BID

BID DUE DATE: _____

PROJECT (Brief Description Including Location):

City of Garden City
2024 LMIG ROAD IMPROVEMENTS
100 Central Avenue
Garden City, Georgia 31405

BOND

BOND NUMBER _____

DATE (Not later than Bid Due Date)_____:

PENAL SUM: 5 PERCENT OF BID

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the following terms hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

TERMS OF BID BOND

a. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond.

b. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the executed Agreement required by the Bidding Documents, any performance and payment bonds, and Certification of Insurance required by the Bidding Documents and Contract Documents.

c. This obligation shall be null and void if:

   1. Owner accepts Bidder's bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents, any performance and payment bonds and Certification of Insurance required by the Bidding Documents and Contract Documents, or
   2. All bids are rejected by Owner, or
   3. Owner fails to issue a notice of award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph e below).

d. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

e. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from the Bid Due Date without Surety's written consent.

f. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph d above is received by Bidder and Surety, and in no case later than one year after Bid Due Date.

g. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

h. Notice required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

i. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or

representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

j. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirements of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of the Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

k. The term "bid" as used herein includes a bid, offer or proposal as applicable.

CONTRACTOR AS PRINCIPAL	SURETY
Company:_____	Company:_____
_____	_____
(Corp. Seal)	(Corp. Seal)
Signature:_____	Signature:_____
_____	_____
Name and Title	Name and Title

Notes:

(1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.
(3) All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.
(4) Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.
(5) The power-of-attorney of the Attorney-in-fact signing for the surety company must be attached to the Bid Bond.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 45 13

STATEMENT OF BIDDER'S QUALIFICATIONS

PART 1 GENERAL

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized and submitted per Section 00 01 30, Instructions to Bidders. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder:_____

2. Permanent main office _____

   _____

3. When organized:_____

4. If a corporation, where incorporated:_____

5. How many years have you been engaged in the contracting business under your present firm or trade name:_____

6. Contacts on hand: (Schedule these, showing amount of each contract, name, address and telephone number of Owner and/or Engineer; and the appropriate anticipated dates of completion.)

7. General character of work performed by your company:

   _____

8. Have you ever failed to complete any work awarded to you?_____

   If so, where and why?_____

   _____

9. Have you ever defaulted on a contract?_____If so, where and why?

   _____

   _____

10. List the more important projects recently completed by your company, stating the approximate cost for each, name, address and telephone number of Owner and/or Engineer; and the month and year completed.

11. List your major equipment and equipment manufacturer available for this contract.

12. Experience in construction work similar in importance to this project

13. Background and experience of the principal members of your organization, including officers.

14. Credit available: $_____

15. Give bank references:_____

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that my be required by the City?_____

17. Have the principals of the corporation ever been associated with another corporation?_____

18. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the City in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated this _____ day of _____, 20____.

_____
NAME OF BIDDER

By:_____

Title:_____

STATE OF _____)

COUNTY OF _____)SS.

_____being duly sworn deposes and says that he is _____of (Name of Organization):_____ and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this _____day of _____, 20____

_____
NOTARY PUBLIC
My Commission Expires

_____,20____

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 00 45 19

NONCOLLUSION AFFIDAVIT

PART 1 GENERAL

THIS AFFIDAVIT IS TO ACCOMPANY THE BID

STATE OF GEORGIA

COUNTY OF _____

_____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any state official or employee as to the quantity, quality, or price in the prospective contract, or any other terms of said prospective contract; or in any discussions between bidders and any state official concerning exchange of money or other thing of value for special consideration in the letting of a contract.

_____
Name of Company

By:_____ _____
Authorized Officer or Agent Date of Execution Affidavit

_____
Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

_____DAY OF _____, 20__

_____ Notary Public

My Commission Expires: _____

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

SECTION 00 45 46.10

AFFIDAVIT VERIFYING STATUS FOR CITY PUBLIC BENEFIT

PART 1 GENERAL

By executing this affidavit under oath, as an applicant for Construction Contract services for Public Infrastructure Construction, as referenced in O.C.G.A. §50-36-1, from City of Garden City, the undersigned applicant verifies one of the following with respect to my application for a public benefit:

1. _____ I am a United States citizen.

2. _____ I am a legal permanent resident of the United States.

3. _____ I am a qualified alien or non-immigrant under the Federal Immigration and Nationality Act with an alien number issued by the Department of Homeland Security or other federal immigration agency.

My alien number issued by the Department of Homeland Security or other federal immigration agency is _____.

The undersigned applicant also hereby verifies that he or she is 18 years of age or older and has provided at least one secure and verifiable document, as required by O.C.G.A. §50-36-1(e)(1), with this affidavit.

The secure and verifiable document provided with this affidavit can best be classified as:

_____

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of O.C.G.A. §16-10-20, and face criminal penalties as allowed by such criminal statute.

Executed in _____(city), _____(state).

By:_____ _____
Signature of Applicant Date

_____
Printed Name of Applicant

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

_____DAY OF _____, 20__

_____ Notary Public

My Commission Expires: _____

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

SECTION 00 45 46.20

GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVITS

PART 1 GENERAL

The City of Garden City and Contractor agree that compliance with the requirements of O.C.G.A. § 13-10-91, as amended, and Rule 300-10-1-.02 of the Rules of the Georgia Department of Labor are conditions of this Agreement for the physical performance of services.

The Contractor further agrees that its compliance with the requirements of O.C.G.A. § 13-10-91, as amended, and DOL Rule 300-10-1-.02 is attested to on the executed Contractor Affidavit and Agreement attached hereto.

If employing or contracting with any subcontractor(s) in connection with this Agreement, Contractor further agrees:

1. To secure from the subcontractor(s) an affidavit attesting to the subcontractor's compliance with O.C.G.A. § 13-10-91, as amended, and DOL Rule 300-10-1-.02; such affidavit being in the form attached hereto; and

2. To submit such subcontractor affidavit(s) to the City when the subcontractor(s) is retained, but in any event, prior to the commencement of work by the subcontractor(s).

The failure of Contractor to supply the affidavit of compliance at the time of execution of this Agreement and/or the failure of Contractor to continue to satisfy the obligations of O.C.G.A. § 13-10-91, as amended, and DOL Rule 300-10-1-.02 as set forth in this Agreement throughout the contract period shall constitute a material breach of the contract. Upon notice of such breach, Contractor shall be entitled to cure the breach within ten days, upon providing satisfactory evidence of compliance with the terms of this Agreement and State law. Should the breach not be cured, City of Garden City shall be entitled to all available remedies, including termination of the contract and damages.

Required Affidavits are included on the following pages.

CONTRACTOR AFFIDAVIT & AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. §13-10-91, as amended, stating affirmatively that the individual, firm or corporation which is contracting with City of Garden City, has registered and is participating in a federal work authorization program* (an electronic verification of work authorization program operated by the U.S. Department of Homeland Security or any equivalent federal work authorization program operated by the U.S. Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the provisions established in O.C.G.A. §13-10-91, as amended.

The undersigned further agrees that should it employ any new employees or contract with any subcontractor(s) for the physical performance of services pursuant to the contract with City of Garden City, the Contractor will secure from the subcontractor(s) verification of compliance with O.C.G.A. §13-10-91, as amended, on the attached Subcontractor Affidavit. The undersigned contractor further agrees to use the federal work authorization program throughout the contract period and to maintain records of such compliance and to provide a copy of each such verification to City of Garden City, at the time the subcontractor(s) is retained to perform such services.

_____ _____
Name of Public Employer Name of Project

_____
Name of Contractor

_____ _____
EEV / Basic Pilot Program* User Identification Number (https://e-verify.uscis.gov/enroll/) Date of Authorization

By:_____ _____
Authorized Officer or Agent Date of Execution Affidavit

_____
Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

_____DAY OF _____, 20__

_____ Notary Public

My Commission Expires: _____

* Note: As of the effective date of O.C.G.A. §13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau (USCIS) of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

SUBCONTRACTOR AFFIDAVIT & AGREEMENT

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. §13-10-91, as amended, stating affirmatively that the individual, firm or corporation which is contracting with _____(Contractor) on behalf of City of Garden City, has registered and is participating in a federal work authorization program* (an electronic verification of work authorization program operated by the U.S. Department of Homeland Security or any equivalent federal work authorization program operated by the U.S. Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the provisions established in O.C.G.A. §13-10-91, as amended. Additionally, the undersigned subcontractor will forward notice of the receipt of an affadavit from a sub-subcontractor that has contracted with a sub-subcontractor to forward, whithin five business days of receipt, a copy of such notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as shown below:

_____ _____
Name of Public Employer Name of Project

_____
Name of Sub-contractor

_____ _____
EEV / Basic Pilot Program* User Identification Number (https://e-verify.uscis.gov/enroll/) Date of Authorization

By:_____ _____
Authorized Officer or Agent Date of Execution Affidavit

_____
Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

_____DAY OF _____, 20__

_____ Notary Public

My Commission Expires: _____

* Note: As of the effective date of O.C.G.A. § 13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau (USCIS) of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

SUB-SUBCONTRACTOR AFFIDAVIT & AGREEMENT

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, as amended, stating affirmatively that the individual, firm or corporation which is contracting with City of Garden City, has registered and is participating in a federal work authorization program* (an electronic verification of work authorization program operated by the U.S. Department of Homeland Security or any equivalent federal work authorization program operated by the U.S. Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the provisions established in O.C.G.A. § 13-10-91, as amended. The undersigned sub-subcontractor shall submit at the time of such contract, this affidavit to the sub-contractor or sub-subcontractor with whom such sub-contractor has privity of contract. Additionally, the undersigned sub-subcontractor will forward notice of the receipt of an affadavit from a sub-subcontractor that has contracted with a sub-subcontractor whithin five business days of receipt, a copy of such notice to the subcontractor or sub-subcontractor whith whom such sub-subcontractor has privity of contract. Sub-subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as shown below:

_____ _____
Name of Public Employer Name of Project

_____
Name of Sub-subcontractor

_____ _____
EEV / Basic Pilot Program* User Identification Number (https://e-verify.uscis.gov/enroll/) Date of Authorization

By:_____ _____
Authorized Officer or Agent Date of Execution Affidavit

_____
Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

_____DAY OF _____, 20__

_____ Notary Public

My Commission Expires: _____

* Note: As of the effective date of O.C.G.A. §13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau (USCIS) of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

****

00 51 00

NOTICE OF AWARD

PART 1 GENERAL

To:

_____

_____

_____

Project Description:

_____

_____

The Owner has considered the Bid submitted by you for the above described Work in response to its Advertisement For Bids dated _____, 20__ and Information For Bidders.

You are hereby notified that your Bid has been accepted for items in the amount of $_____

You are required by the Instructions to Bidders document to execute the General Contract and furnish the required Performance Bond and Payment Bond within ten calendar days from the date of receipt of this Notice by you. Return all document copies to the Engineer for further processing, review and distribution to the parties to the contract.

If you fail to execute said Agreement and to furnish said Bonds within ten days from the date of receipt of this Notice, the Owner will be entitled to consider his rights stipulated in the Contract Documents.

You are required to return acknowledged copies of this Notice Of Award and Agreement to the Engineer within ten days of receipt of the Documents.

Dated this _____day of _____, 20__.

Owner: _____

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the Notice of Award is hereby acknowledged by:

_____

By:_____

Title:_____

Date:_____

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 52 13

AGREEMENT

PART 1 GENERAL

THIS AGREEMENT is dated as of the _____day of _____in the year 2025 by and between City of Garden City (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR). OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1.1 WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

2024 LMIG ROAD IMPROVEMENTS

1.2 ENGINEER

The Project has been designed by Brennan Jones Engineering Associates, LLC, who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

1.3 CONTRACT TIMES

a. The Work will be substantially completed within 60 days after the date when the Contract Times commence to run as provided in the General Conditions, and completed and ready for final payment in accordance with the General Conditions within 75 days after the date when the Contract Times commence to run.

b. Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in Paragraph "CONTRACT TIMES" Subparagraph a above, plus any extensions thereof allowed in accordance with the General Conditions.

c. They also recognize the delays, expense and difficulties involved in proving the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER two hundred fifty dollars ($250.00) for each day that expires after the time specified in Paragraph "CONTRACT TIMES" Subparagraph a above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the time specified in Paragraph "CONTRACT TIMES" Subparagraph a for completion and readiness for final payment or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER two hundred fifty dollars ($250.00) for each day that expires after the time specified in Paragraph "CONTRACT TIMES" Subparagraph a for completion and readiness for final payment.

1.4 CONTRACT PRICE

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Subparagraph a below:

a. The Contractor agrees to perform all of the Work described in the Contract Documents and comply with the terms therein for the sum of _____

($_____), payable in current funds, subject to adjustments, if any, as provided in the Contract Documents.

1.5 PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with Part "PAYMENTS TO CONTRACTOR AND COMPLETION" of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

1.5.1 Progress Payments/Retainage

OWNER shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by ENGINEER during construction as provided in Subparagraphs a and b below.

a. All such payments will be measured by values of work completed as provided by the schedule established in the General Conditions (and in the case of Unit Price Work based on the number of units completed), plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and with the OWNER's consent, such materials and equipment suitably stored, insured and protected off-site at a location approved by the ENGINEER, less a retainage of ten percent of each progress payment requested; provided, however, when fifty percent of the Contract Price, including change orders and other additions to the Contract, is due and the manner of completion of the contract work and its progress is reasonably satisfactory to the ENGINEER, in its sole discretion, the OWNER shall withhold no more retainage on additional work completed. The CONTRACTOR shall be entitled to withhold retainage from subcontractors accordingly. At the discretion of the OWNER, upon recommendation of the ENGINEER and with consent of the CONTRACTOR, the retainage of each subcontractor may be released separately as the subcontractor completes his work.

b. If, after discontinuing the retainage, the ENGINEER determines that the work is unsatisfactory or has fallen behind schedule, retention shall be resumed at the previous level. If retention is resumed, the CONTRACTOR shall be entitled to withhold retainage from subcontractors accordingly.

1.5.2 Final Payment

a. At substantial completion of the contract work and as the ENGINEER determines the work to be reasonably satisfactory, the OWNER shall within 30 days after presentation of Application and other appropriate documentation as required by the General Conditions are provided, pay the retainage to the CONTRACTOR. If at that time there are any remaining incomplete minor items, an amount equal to 200 percent of the value of each item, as determined by the ENGINEER, shall be

withheld until such item or items are completed. The reduced retainage shall be shared by the CONTRACTOR and subcontractors as their interests may appear. The CONTRACTOR shall, within ten days from CONTRACTOR's receipt of retainage from the OWNER, pass through payments to subcontractors and shall reduce each subcontractor's retainage in the same manner as the CONTRACTOR's retainage is reduced by the OWNER provided that the value of each subcontractor's work complete and in place equals fifty percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided further that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work, including any warranty work as the CONTRACTOR in his reasonable discretion may require, including, but not limited to, a payment and performance bond.

b. The subcontractor shall, within ten days from the subcontractor's receipt of retainage from the CONTRACTOR, pass through payments to the lower tier subcontractors and shall reduce each lower tier subcontractor's retainage in the same manner as the subcontractor's retainage is reduced by the CONTRACTOR, provided that the value of each lower tier subcontractor's work complete and in place equals fifty (50%) percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the subcontractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.

c. All prior certificates or estimates upon which payments have been made are approximate only, and subject to correction in the final payment.

1.5.3 Contractor's Agreements with Subcontractors

The CONTRACTOR hereby covenants and agrees with OWNER to obtain written agreements from each subcontractor setting forth payment procedures in accordance with the foregoing provisions of this Section. Nothing contained herein shall preclude the CONTRACTOR, prior to making payment to a subcontractor, from requiring the payee to submit satisfactory evidence that all payrolls, materials bills, and other indebtedness connected with the work have been paid

1.6 CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

a. CONTRACTOR has examined and carefully studied the Contract Documents (including the Addenda listed in Paragraph "CONTRACT DOCUMENTS", if any) and the other related data identified in the Bidding Documents including "technical data."

b. CONTRACTOR has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, process, performance or furnishing of the Work.

c. CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

d. CONTRACTOR has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph "Subsurface and Physical Conditions" of the General Conditions. CONTRACTOR accepts the determination set forth in the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which CONTRACTOR is entitled to rely as provided in Paragraph "Subsurface and Physical Conditions" of the General Conditions. CONTRACTOR acknowledges that such reports and drawings are not Contract Documents and may not be complete for CONTRACTOR's purposes. CONTRACTOR acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the site. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

e. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the site that relates to the Work as indicated in the Contract Documents.

f. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

g. CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

1.7 CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

a. Agreement

b. Bid Form
c. Performance Bond
d. Payment Bond
e. Notice to Proceed
f. General Conditions
g. Supplementary Conditions
h. Specifications bearing the title 2024 LMIG ROAD IMPROVEMENTS as listed in table of contents thereof.
i. Drawings bearing the title 2024 LMIG ROAD IMPROVEMENTS.
j. Addenda number(s)_____ to _____, inclusive.
k. Documentation submitted by CONTRACTOR (if applicable) prior to Notice of Award.
l. Other exhibits (if applicable) to this Agreement marked, _____.
m. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto:

All written Amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to requirements of the General Conditions.

The documents listed as "Bid Form" et seq. above are attached to this Agreement (except as expressly noted otherwise above).

There are not Contract Documents other than those listed above in this Paragraph "CONTRACT DOCUMENTS". The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions.

1.8 MISCELLANEOUS

a. Terms used in this Agreement, which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

b. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

c. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

d. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER,

CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed, initialed or identified by OWNER and CONTRACTOR or identified by ENGINEER on their behalf.

This Agreement will be effective on _____, 20____ (which is the Effective Date of the Agreement)

OWNER:	**CONTRACTOR:**
_____	_____
By:_____	By:_____
Title:_____	Title:_____
(SEAL)	(SEAL)
Attest_____	Attest_____
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
(Attach evidence of authority to sign and resolution or other documents authorizing execution of Agreement)	Agent for service of process: _____ (If CONTRACTOR is a corporation, of authority to sign.)

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

SECTION 00 55 00

NOTICE TO PROCEED

PART 1 GENERAL

1.1 REFERENCES

To:

_____

_____

_____

Project Description:

_____

_____

You are hereby notified to commence Work in accordance with the Agreement dated _____, 2025 and you are to complete the Work within _____ consecutive calendar days thereafter. The date of completion of all Work is therefore _____, 20__.

Dated this _____ day of _____, 20__.

Owner: _____

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the Notice of Award is hereby acknowledged by:

_____

By:_____

Title:_____

Date:_____

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 61 13.13

PERFORMANCE BOND

PART 1 GENERAL

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR: (Name and Address)

_____

_____

_____

_____

OWNER:
City of Garden City
100 Central Avenue
Garden City, Georgia 31405

CONSTRUCTION CONTRACT:

Date: _____

Amount: _____

Description (Name and Location):
City of Garden City
2024 LMIG ROAD IMPROVEMENTS
100 Central Avenue
Garden City, Georgia 31405

SURETY (Name and Principal Place of Business):_____

_____

_____

BOND:

Date: _____

Amount: _____ **100 percent of contract amount)**

Bond Number: _____

a. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

b. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to

participate in conferences as provided in Subparagraph c.1 below.

c. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

1. The Owner has notified the Contractor and the Surety at its address described in Paragraph j below, that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

2. The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph c.1 above; and

3. The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

d. When the Owner has satisfied the conditions of Paragraph c above, the Surety shall promptly and at the Surety's expense take one of the following actions:

1. Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

2. Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the

4. Pay Owner the amount of damages as described in Paragraph f below in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

5. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

a. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefore to the Owner; or

b. Deny liability in whole or in part and notify the Owner citing reasons therefor.

e. If the Surety does not proceed as provided in Paragraph d above with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph d.4 above, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

f. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraphs d.1, d.2, or d.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

1. The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

2. Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the action or failure to act of the Surety under Paragraph d above; and

3. Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

g. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.

h. The Surety hereby waives notice of any change, including changes of time to the Construction Contract or to related subcontracts, purchase orders and other obligations.

i. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

j. Notice to the Surety or the Contractor shall be mailed or delivered to the address shown on the signature page.

k. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

l. Definitions.

1. Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

2. Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

3. Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

4. Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

CONTRACTOR AS PRINCIPAL	SURETY
Company:_____	
_____	
_____	
_____	
(Corp. Seal)	(Corp. Seal)
Signature:_____	
Signature:_____	
_____	
_____	
Name and Title	Name and Title
Contractor Address for Giving Notices:	Surety Address for Giving Notices:
_____	
_____	
_____	
_____	

Notes:

(1) Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

(2) The power-of-attorney of the Attorney-in-fact signing for the surety company must be attached to the Performance Bond.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 61 13.16

PAYMENT BOND

PART 1 GENERAL

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR: (Name and Address)

_____

_____

_____

_____

OWNER:
City of Garden City
100 Central Avenue
Garden City, Georgia 31405

CONSTRUCTION CONTRACT:

Date: _____

Amount: _____

Description (Name and Location):
City of Garden City
2024 LMIG ROAD IMPROVEMENTS
100 Central Avenue
Garden City, Georgia 31405

SURETY (Name and Principal Place of Business):_____

_____

_____

BOND:

Date: _____

Amount: _____ **100 percent of contract amount)**

Bond Number: _____

a. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner and for the use and protection of all subcontractors and persons supplying labor, materials, machinery and equipment in the prosecution of the Work involved in this Construction Contract.

b. With respect to the Owner, this obligation shall be null and void if

the Contractor:

1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
2. Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 11) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

c. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment directly or indirectly, for all sums due.

d. The Surety shall have no obligations to Claimant unless the Claimant has substantially complied with the requirements of O.C.G.A. 36-82-104 by giving the notices provided for therein. Each Claimant failing to substantially comply with said Code Section shall be deemed to have waived the protection of the payment bond. No Claimant shall file an action for payment against the Owner, Contractor or Surety, except in accordance with this section.

1. Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address shown on the signature page) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

2. Claimants who do not have a direct contract with the Contractor:

a. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim, stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

b. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

c. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address shown on the signature page) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

e. If a notice required by Paragraph d above is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

f. When the Claimant has satisfied the conditions of Paragraph d above, the Surety shall promptly and at the Surety's expense, take the

following actions:

1. Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and that basis for challenging any amount that are disputed.

2. Pay or arrange for payment of any undisputed amounts.

g. The Surety's total obligation shall not exceed the amount of this Bond and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

h. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

i. The Surety shall not be liable to the Owner, Claimants or others for obligation of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments, to give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

j. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

k. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on this Bond.

l. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in the Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

m. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

n. Definitions:

1. Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include

without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

2. Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

3. Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

CONTRACTOR AS PRINCIPAL	SURETY
Company:_____	Company:_____
_____	_____
(Corp. Seal)	(Corp. Seal)
Signature:_____	Signature:_____
_____	_____
Name and Title	Name and Title
Contractor Address for Giving Notices:	Surety Address for Giving Notices:
_____	_____
_____	_____

Notes:

(1) Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

(2) The power-of-attorney of the Attorney-in-fact signing for the surety company must be attached to the Payment Bond.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

00 72 00

GENERAL CONDITIONS

PART 1 DEFINITIONS AND TERMINOLOGY

1.1 DEFINED TERMS

a. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial letters in the Contract Documents include references to identified parts and paragraphs, and the titles of other documents or forms.

1. Addenda: Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. Agreement: The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. Applicationfor Payment: The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. Asbestos: Any material that contains more than one percent asbestos and is mable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. Bid: The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. Bidder: The individual or entity who submits a Bid directly to Owner.

7. Bidding Documents: The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. Bidding Requirements: The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. Change Order: A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. Claim: A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. Contract: The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. Contract Documents: Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. Contract Price: The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.3 in the case of Unit Price Work).

14. Contract Times: The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so thatit is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. Contractor: The individual or entity with whom Owner has entered into the Agreement.

16. Cost of the Work-See Paragraph 11.1.a for definition.

17. Drawings: That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. Effective Date of the Agreement: The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. Engineer: The individual or entity named as such in the Agreement.

20. Field Order: A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. General Requirements: Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. Hazardous Environmental Condition: The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. Hazardous Waste: The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. Laws and Regulations; Laws or Regulations: Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. Liens: Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. Milestone: A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. Notice of Award: The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. Notice to Proceed: A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. Owner: The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. PCBs: Polychlorinated biphenyls.

31. Petroleum: Petroleum, including crude oil or any fRaction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. Progress Schedule: A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. Project: The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. Project Manual: The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. Radioactive Material: Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. Related Entity: An officer, director, partner, employee, agent, consultant, or subcontractor.

37. Resident Project Representative: The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. Samples: Physical examples of materials,equipment, or workmanship

that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. Schedule of Submittals: A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. Schedule of Values: A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. Site: Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. Specifications: That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

44. Subcontractor: An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. Substantial Completion: The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. Successful Bidder: The Bidder submitting a responsive Bid to whom Owner makes an award.

47. Supplementary Conditions: That part of the Contract Documents which amends or supplements these General Conditions.

48. Supplier: A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. Underground Facilities: All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water,

other liquids or chemicals, or traffic or other control systems.

50. Unit Price Work: Work to be paid for on the basis of unit prices.

51. Work: The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. Work Change Directive: A written statementto Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evident that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.2 TERMINOLOGY

a. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

b. Intent of Certain Terms or Adjectives

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9 or any other provision of the Contract Documents.

c. Day

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

d. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents, or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.4 or 14.5).

e. Furnish, Install, Perform, Provide

1. The word "furnish", when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install", when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide", when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish", "install", "perform", or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

f. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

PART 2 PRELIMINARY MATTERS

2.1 DELIVERY OF BONDS AND EVIDENCE OF INSURANCE

a. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

b. Evidence of Insurance: Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with PART 5.

2.2 COPIES OF DOCUMENTS

a. Owner shall furnish to Contractor up to five printed or hard copies of

the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.3 COMMENCEMENT OF CONTRACT TIMES; NOTICE TO PROCEED

a. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.4 STARTING THE WORK

a. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.5 BEFORE STARTING CONSTRUCTION

a. Preliminary Schedules: Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.6 PRECONSTRUCTION CONFERENCE

a. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.5.a, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.7 INITIAL ACCEPTANCE OF SCHEDULES

a. At least ten days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.5.a. Contractor shall have an additional ten days to make corrections and adjustments and to complete and resubmit the

schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor ftom Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

PART 3 CONTRACT DOCUMENTS: INTENT AMENDING, REUSE

3.1 INTENT

a. The Contract Documents are complementary; what is required by one is as binding as if required by all.

b. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

c. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in PART 9.

d. In case of unresolved conflict between items of the Contract Documents, the following order of precedence shall govern, with the higher item taking precedence over a lower item:

1. Contract (including Supplemental Agreements and Change Orders thereto)
2. Addenda
3. Instructions to Bidders
4. Bid
5. Supplemental General Conditions
6. General Conditions
7. Specifications
8. Federal Provisions and Regulations
9. Governing Standard Specifications
10. Schedules on Drawings
11. Notes on Drawings
12. Details on Drawings
13. Large Scale Drawings
14. Small Scale Drawings
15. Dimensions Given in Figures
16. Scaled Dimensions
17. Additional Instructions and Detail Drawings
18. Shop Drawings

3.2 REFERENCE STANDARDS

a. Standards, Specifications, Codes, Laws, and Regulations.

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.3 REPORTING AND RESOLVING DISCREPANCIES

a. Reporting Discrepancies

1. Contractor's Review of Contract Documents Before Starting Work: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. Contractor's Review of Contract Documents During Performance of Work: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.a) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.4.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

b. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take

precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions- of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.4 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS

a. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

b. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.d.3); or

3. Engineer's written interpretation or clarification.

3.5 REUSE OF DOCUMENTS

a. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

b. The prohibition of this Paragraph 3.5 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.6 Electronic Data

a. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

b. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

PART 4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.1 AVAILABILITY OF LANDS

a. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.5.

b. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

c. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 SUBSURFACE AND PHYSICAL CONDITIONS

a. Reports and Drawings: The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

b. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's

purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.3 DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

a. Notice: If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.2 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

5. then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.a), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

b. Engineer's Review: After receipt of written notice as required by Paragraph 4.3.a, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

c. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.3.a; and

b. with respect to Work that is paid for on a Unit Price Basis,

any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.7 and 11.3.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 4.3.a.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.5. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.4 UNDERGROUND FACILITIES

a. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

   1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

   2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

      a. reviewing and checking all such information and data,

      b. locating all Underground Facilities shown or indicated in the Contract Documents,

      c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

      d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

b. Not Shown or Indicated

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.a), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.5.

4.5 REFERENCE POINTS

a. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.6 HAZARDOUS ENVIRONMENTAL CONDITION AT SITE

a. Reports and Drawings: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

b. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim

against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

c. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

d. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.a); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

e. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.5.

f. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.5. Owner may have such deleted portion of the Work performed by Owner's own forces or others

in accordance with PART 7.

g. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.6.g shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

h. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.6.h shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

i. The provisions of Paragraphs 4.2, 4.3, and 4.4 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

PART 5 BONDS AND INSURANCE

5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS

a. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.7, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

b. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

c. If the surety on any bond furnished by Contractor is declared bankrupt

or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.1.b, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.1.b and 5.2.

5.2 LICENSED SURETIES AND INSURERS

a. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.3 CERTIFICATES OF INSURANCE

a. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

5.4 CONTRACTOR'S LIABILITY INSURANCE

a. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

b. The policies of insurance required by this Paragraph 5.4 shall:

1. with respect to insurance required by Paragraphs 5.4.a.3 through 5.4.a.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.3 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.7; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.5 OWNER'S LIABILITY INSURANCE

a. In addition to the insurance required to be provided by Contractor under Paragraph 5.4, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.6 PROPERTY INSURANCE

a. Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

b. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.6 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.7.

c. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.6 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the

Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

d. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.6, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.7 WAIVER OF RIGHTS

a. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.6 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

b. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.5, after Substantial Completion pursuant to Paragraph 14.4, or after final payment pursuant to Paragraph 14.7.

c. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.7.b shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.8 RECEIPT AND APPLICATION OF INSURANCE PROCEEDS

a. Any insured loss under the policies of insurance required by Paragraph 5.6 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.8.b. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

b. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.9 ACCEPTANCE OF BONDS AND INSURANCE; OPTION TO REPLACE

a. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with PART 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within ten days after receipt of the certificates (or other evidence requested)required by Paragraph 2.1.b. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 PARTIAL UTILIZATION, ACKNOWLEGEMENT OF PROPERTY INSURER

a. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.5, no such use or occupancy shall commence before the

insurers providing the property insurance pursuant to Paragraph 5.6 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

PART 6 CONTRACTOR'S RESPONSIBILITY

6.1 SUPERVISION AND SUPERINTENDENCE

a. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

b. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor. Provide a resume showing a minimum of five years experience in constructing similar projects.

6.2 LABOR: WORKING HOURS

a. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

b. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

c. The Contractor shall not interrupt Owner's operations without prior written approval.

6.3 SERVICES, MATERIALS AND EQUIPMENT

a. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start?up, and completion of the Work.

b. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

c. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.4 PROGRESS SCHEDULE

a. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.7 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.7) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of PART 12. Adjustments in Contract Times may only be made by a Change Order.

6.5 SUBSTITUTES AND "OR-EQUALS"

a. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. "Or-Equal" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.5.a.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1. it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2. it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3. it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1. there will be no increase in cost to the Owner or increase in Contract Times, and

2. it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.5.a.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.5.a.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. T he application:

1. shall certify that the proposed substitute item will:

a. perform adequately the functions and achieve the results called for by the general design,

b. be similar in substance to that specified, and

c. be suited to the same use as that specified;

2. will state:

a. the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b. whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed

substitute item; and

c. whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3. will identify:

a. all variations of the proposed substitute item from that specified , and

b. available engineering, sales, maintenance, repair, and replacement services;

4. and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

b. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.5.a.2.

c. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.5.a and 6.5.b. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

d. Special Guarantee: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

e. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.5.a.2 and 6.5.b whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

f. Contractor's Expense: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.6 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS

a. Contractor shall not employ any Subcontractor, Supplier, or other

individual or entity (including those acceptable to Owner as indicated in Paragraph 6.6.b), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

b. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued . No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

c. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

    1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

    2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

d. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

e. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

f. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

g. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the

Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.6, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.7 PATENT FEES AND ROYALTIES

a. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

b. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.8 PERMITS

a. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.9 LAWS AND REGULATIONS

a. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work.

Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

b. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.3.

c. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.5.

6.10 TAXES

a. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

b. The Contractor shall furnish the Owner with records and appropriate affidavits of all state sales tax paid on items which are eligible for tax refund to the Owner.

6.11 USE OF SITE AND OTHER AREAS

a. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or

other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

b. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

c. Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

d. Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 RECORD DOCUMENTS

a. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 SAFETY AND PROTECTION

a. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

b. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground

Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

c. Contractor shall comply with applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

d. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

c. ell damage, injury, or loss to any property referred to in Paragraph 6.13.a.2 or 6.13.a.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

f. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.7.b that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 SAFETY REPRESENTATIVE

a. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs

6.15 HAZARD COMMUNICATION PROGRAMS

a. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 EMERGENCIES

a. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order

will be issued.

6.17 SHOP DRAWINGS AND SAMPLES

a. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.7). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.d.

2. Samples: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.d.

b. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

c. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

d. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.c.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.c.1.

e. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 CONTINUING THE WORK

a. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be

delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.4 or as Owner and Contractor may otherwise agree in writing.

6.19 CONTRACTOR'S GENERAL WARRANTY AND GUARANTEE

a. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

b. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

c. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 INDEMNIFICATION

a. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to

perform any of the Work or anyone for whose acts any of them may be liable.

b. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.a shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

c. The indemnification obligations of Contractor under Paragraph 6.20.a shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 DELEGATION OF PROFESSIONAL DESIGN SERVICES

a. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

b. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

c. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

d. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited

purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.d.1.

e. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

PART 7 OTHER WORK AT THE SITE

7.1 RELATED WORK AT SITE

a. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.5.

b. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

c. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this PART 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.2 COORDINATION

a. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in

Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

b. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.3 LEGAL RELATIONSHIPS

a. Paragraphs 7.1.a and 7.2 are not applicable for utilities not under the control of Owner.

b. Each other direct contract of Owner under Paragraph 7.1.a shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

c. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

PART 8 OWNER'S RESPONSIBILITIES

8.1 COMMUNICATIONS TO CONTRACTOR

a. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.2 REPLACEMENT OF ENGINEER

a. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.3 FURNISH DATA

a. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.4 PAY WHEN DUE

a. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.2.c and 14.7.c.

8.5 LANDS AND EASEMENTS: REPORTS AND TESTS

a. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.1 and 4.5. Paragraph 4.2 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of

physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.6 INSURANCE

a. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in PART 5.

8.7 CHANGE ORDERS

a. Owner is obligated to execute Change Orders as indicated in Paragraph 10.3.

8.8 INSPECTIONS, TESTS AND APPROVALS

a. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.3.b.

8.9 LIMITATIONS ON OWNER'S RESPONSIBILITIES

a. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

b. Owner has the right to limit or schedule, with Contractor's input, any work that may affect operation of Owner's facilities.

8.10 UNDISCLOSED HAZARDOUS ENVIRONMENTAL CONDITION

a. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.6.

8.11 EVIDENCE OF FINANCIAL ARRANGEMENTS

a. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

PART 9 ENGINEER'S STATUS DURING CONSTRUCTION

9.1 OWNER'S REPRESENTATIVE

a. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.2 VISITS TO SITE

a. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the

progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

b. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.9. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.3 PROJECT REPRESENTATIVE

a. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.9. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.4 AUTHORIZED VARIATIONS IN WORK

a. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.5.

9.5 REJECTING DEFECTIVE WORK

a. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer

will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.4, whether or not the Work is fabricated, installed, or completed.

9.6 SHOP DRAWINGS, CHANGE ORDERS AND PAYMENTS

a. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

b. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

c. In connection with Engineer's authority as to Change Orders, see PART 10, 11, and 12.

d. In connection with Engineer's authority as to Applications for Payment, see PART 14.

9.7 DETERMINATIONS FOR UNIT PRICE WORK

a. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.5.

9.8 DECISIONS ON REQUIREMENTS OF CONTRACT DOCUMENTS AND ACCEPTABILITY OF WORK

a. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

b. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.5. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.5.b.

c. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.5.

d. When functioning as interpreter and judge under this Paragraph 9.8, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.9 LIMITATIONS ON ENGINEER'S AUTHORITY AND RESPONSIBILITIES

a. Neither Engineer's authority or responsibility under this PART 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

b. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

c. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

d. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.7.a will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

e. The limitations upon authority and responsibility set forth in this Paragraph 9.9 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

PART 10 CHANGES IN THE WORK: CLAIMS

10.1 AUTHORIZED CHANGES IN THE WORK

a. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

b. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.5.

10.2 UNAUTHORIZED CHANGES IN THE WORK

a. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work

performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.4, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.4.b.

10.3 EXECUTION OF CHANGE ORDERS

a. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.1.a, (ii) required because of acceptance of defective Work under Paragraph 13.8.a or Owner's correction of defective Work under Paragraph 13.9, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.5; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.a.

10.4 NOTIFICATION TO SURETY

a. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.5 CLAIMS

a. Engineer's Decision Required: All Claims, except those waived pursuant to Paragraph 14.9, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

b. Notice: Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.1.b. A Claim for an adjustment in Contract Time shall be prepared in accordance with the

provisions of Paragraph 12.2.b. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

c. Engineer's Action: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

d. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

e. Engineer's written action under Paragraph 10.5.c or denial pursuant to Paragraphs 10.5.c.3 or 10.5.d will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in PART 16 within 30 days of such action or denial.

f. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.5.

PART 11 COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.1 COST OF THE WORK

a. Costs Included: The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.1.b, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.1.b.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and

holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.1.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

   c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

   e. Deposits lost for causes other than negligence of Contractor,

any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.6.d), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

b. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.1.a.1 or specifically covered by Paragraph 11.1.a.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.1.a and 11.1.b.

c. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.1.c.

d. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.1.a and 11.1.b, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.2 ALLOWANCES

a. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

b. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation , overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

c. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

d. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.3 UNIT PRICE WORK

a. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

b. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of

Paragraph 9.7.

c. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

d. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.5 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

PART 12 CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.1 CHANGE OF CONTRACT PRICE

a. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.5.

b. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.3); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.1.c.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.1.b.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.1) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.1.c).

c. Contractor's Fee: The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the

Work:

a. for costs incurred under Paragraphs 11.1.a.1 and 11.1.a.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.1.a.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.1.c.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.1.a.1 and 11.1.a.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.1.a.4, 11.1.a.5, and 11.1.b;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.1.c.2.a through 12.1.c.2.e, inclusive.

12.2 CHANGE OF CONTRACT TIMES

a. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.5.

b. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this PART 12.

12.3 DELAYS

a. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.2.a. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by PART 7, fires, floods, epidemics, abnormal weather conditions, or acts of God. The Supplementary Conditions indicate the average number of days per month in which precipitation is in excess of 0.1 inches per day. The completion time will not be extended for precipitation unless the number of days per month exceed the number of days indicated in the Supplementary Conditions.

b. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by PART 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

c. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.3.c.

d. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

e. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

PART 13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.1 NOTICE OF DEFECTS

a. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this PART 13.

13.2 ACCESS TO WORK

a. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.3 TESTS AND INSPECTIONS

a. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

b. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by

the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.3.c and 13.3.d below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.4.c; and

3. as otherwise specifically provided in the Contract Documents.

4. testing lab brought onto the site prior to completion of the portion of the work to be tested, the Contractor shall have all work in place and approved by the Engineer prior to bringing testing lab to the site.

c. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

d. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

e. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

f. Uncovering Work as provided in Paragraph 13.3.e shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.4 UNCOVERING WORK

a. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

b. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

c. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other

professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.5.

d. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.5.

13.5 OWNER MAY STOP THE WORK

a. If the Engineer deems the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may direct the Engineer to order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.6 CORRECTION OR REMOVAL OF DEFECTIVE WORK

a. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

b. When correcting defective Work under the terms of this Paragraph 13.6 or Paragraph 13.7, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.7 CORRECTION PERIOD

a. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.a is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

b. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

c. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

d. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.7, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

e. Contractor's obligations under this Paragraph 13.7 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.8 ACCEPTANCE OF DEFECTIVE WORK

a. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph

10.5. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.9 OWNER MAY CORRECT DEFECTIVE WORK

a. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.6.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

b. In exercising the rights and remedies under this Paragraph 13.9, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

c. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.9 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.5. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

d. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.9.

PART 14 PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 SCHEDULE OF VALUES

a. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.2 PROGRESS PAYMENTS

a. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

b. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.7, and to any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be

deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.2.b.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.9; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.2.a.

c. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.2.d) become due, and when due will be paid by Owner to Contractor.

d. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set?off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.2.b.5.a through 14.2.b.5.c or Paragraph 15.2.a.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.2.c.1.

14.3 CONTRACTOR'S WARRANTY OF TITLE

a. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.4 SUBSTANTIAL COMPLETION

a. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

b. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

c. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after

receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

d. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

e. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.5 PARTIAL UTILIZATION

a. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete,

Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.6 FINAL INSPECTION

a. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.7 FINAL PAYMENT

a. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.4.b.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.7.a.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or

receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

b. Engineer's Review of Application and Acceptance

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.9. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

c. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and, will be paid by Owner to Contractor.

14.8 FINAL COMPLETION DELAYED

a. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.9 WAIVER OF CLAIMS

a. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.6, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than

those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

PART 15 SUSPENSION OF WORK AND TERMINATION

15.1 OWNER MAY SUSPEND WORK

a. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an extension of the Contract Times directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.5.

15.2 OWNER MAY TERMINATE FOR CAUSE

a. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.7 as adjusted from time to time pursuant to Paragraph 6.4);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

b. If one or more of the events identified in Paragraph 15.2.a occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

c. If Owner proceeds as provided in Paragraph 15.2.b, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs,

losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

d. Notwithstanding Paragraphs 15.2.b and 15.2.c, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

e. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

f. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.1.a, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.2.b, and 15.2.c.

g. The Contractor acknowledges and agrees that if any court rules that termination by the Owner was wrongful termination, such action by the Owner shall be deemed a termination for convenience and the Contractor shall only be entitled to recover legitimate expenses as disclosed in Paragraph 15.3.

15.3 OWNER MAY TERMINATE FOR CONVENIENCE

a. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

b. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from

such termination.

PART 16 DISPUTE RESOLUTION

16.1 METHODS AND PROCEDURES

a. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.5 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.5.e.

b. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

c. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.5.c or a denial pursuant to Paragraphs 10.5.c.3 or 10.5.d shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

    1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

    2. agrees with the other party to submit the Claim to another dispute resolution process, or

    3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

PART 17 MISCELLANEOUS

17.1 GIVING NOTICE

a. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

    1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

    2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.2 COMPUTATION OF TIMES

a. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. I f the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.3 CUMULATIVE REMEDIES

a. The duties and obligations imposed by these General Conditions and the

rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.4 SURVIVAL OF OBLIGATIONS

a. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.5 CONTROLLING LAW

a. This Contract is to be governed by the law of the state in which the Project is located.

17.6 HEADINGS

a. PART and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

-- End of Section --

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SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

1.1 Related Documents

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 Insurance Requirements

The limits of liability for the insurance required by Part 5 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

Workers' Compensation

(1)	State:	Statutory
(2)	Applicable Federal (e.g. Longshoreman's	Statutory
(3)	Employer's Liability	$1,000,000 per occurrence $1,000,000 per person

Contractor's Liability Insurance, which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:

(1)	General Aggregate (Except Produces -- Completed Operations	$1,000,000
(2)	Products -- Completed Operations Aggregate	$1,000,000
(3)	Personnel and Advertising Injury (Per Person/Organization)	$1,000,000
(4)	Each Occurrence (Bodily Injury and Property Damage)	$1,000,000
(5)	Property Damage liability insurance will provide Explosion, Collapse and Underground coverages where applicable.	
(6)	Excess Liability General Aggregate Each Occurrence	 $2,000,000 $1,000,000

Automobile Liability:

(1)	Bodily Injury: Each Person Each Accident	 $1,000,000 $1,000,000
	Property Damage Each Accident	 $1,000,000

(2) Combined Single Limit (Bodily Injury and Property Damage):
Each Accident $1,000,000

Contractual Endorsement: The Contractual Liability coverage shall provide coverage for not less than the following amounts:
(1) General Aggregate $1,000,000

(2) Each Occurrence
Bodily Injury and Property Damage $1,000,000

Additional Insureds:
Additional insureds on all insurance shall be listed as follows:
City of Garden City, Georgia
Brennan Jones Engineering Associates, LLC

1.3 Normal Weather Conditions

Average Number of Days in which precipitation is in excess of 0.10 inches per day is tabulated below for the region in which the project is located. Completion time will not be extended for normal weather conditions. The time for completion as stated in the Contract Documents includes due allowance for calendar days on which work cannot be performed. For the purpose of this Contract, the Contractor agrees that he may expect to lose calendar days due to weather in accordance with the following table:

Jan.	9 days	May	8 days	Sep.	10 days
Feb.	8 days	June	12 days	Oct.	6 days
Mar.	9 days	July	13 days	Nov.	7 days
Apr.	7 days	Aug.	13 days	Dec.	8 days

Also, the Contractor agrees that the measure of extreme weather during the period covered by this Contract shall be the number of days in excess of those shown for each month in the table above, in which precipitation exceeded 0.10 inch and the average temperature failed to exceed 40 degrees F., averaged from the Savannah International Airport weather station in Savannah, Georgia. This is the same source of data used to determine normal weather losses. If the total accumulated number of calendar days lost to weather, from the start of work until the completion of project exceeds that total accumulated number to be expected for the same period from the table above, time for completion will be extended by the number of calendar days needed to include the excess number of calendar days lost. Request for extension in contract time shall be done in accordance with the General Conditions.

No change in Contract Sum will be authorized because of adjustments of Contract Time due to Owner's acceptance of Contract Claims for adjustments to Time due to abnormal weather conditions.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

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SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

Division I includes resurfacing of streets within the Chatham Villa Subdivision including Chatham Villa Drive, Byck Avenue, Olmstead Place, and Jasper Drive including approximately 6,675 linear feet (LF). The Work includes approximately 1,342 tons of asphalt pavement including milling, patching, placement of surface course, shoulder grading, temporary and permanent striping/marking, permanent grassing/stabilization, traffic control, and other related work.

Division II includes resurfacing of Salt Creek Road (from Pineland Drive to the dead end of Salt Creek Rd), including approximately 6,985 linear feet (LF). The Work includes approximately 1,265 tons of asphalt pavement including milling, patching, placement of surface course, shoulder grading, temporary and permanent striping/marking, permanent grassing/stabilization, traffic control, and other related work.

1.1.2 Location

Division I work is located within the Chatham Villa Subdivision including Chatham Villa Drive, Byck Avenue, Olmstead Place, and Jasper Drive The project site location is shown on the drawings.

Division II work is located on Salt Creek Road from Pineland Drive to the dead end of Salt Creek Rd. The project site location is shown on the drawings.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

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MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section specifies administrative and procedural requirements for unit prices.

A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be multiplied by the actual quantity of work completed to obtain a total cost of work for each bid item. The total cost of each of the bid items will be added to determine the Contract Sum. Any differences in the actual versus estimated quantities of work will be multiplied by the unit price to obtain a total bid item cost adjustment that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.

Unit prices include all necessary material, labor, equipment, overhead, profit and applicable taxes.

Refer to other specification sections for construction activities required under the applicable unit prices.

The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

1.2.1 Schedule

A "Unit Price Description Schedule" is included at the end of this Section. Methods of measurement and payment and general requirements are specified in the schedule.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

Total compensation to the Contractor will be computed from the authorized quantity of satisfactorily completed Bid unit price items comprising the completed Work. No item will be measured for payment unless that item consists of authorized work and appears on the Bid form or is included in a Change Order. Payment for necessary work which is not directly related

to a unit price item is considered to be distributed pro rata among authorized unit price items.

3.2 UNIT PRICES

Measurement and payment will be based on completed work performed in accordance with the drawings, specifications, and the contract payment schedules. Payment will include the furnishing of all testing, labor, equipment, and materials and incidentals necessary to complete the work, as specified and as shown.

3.3 UNIT PRICE DESCRIPTION SCHEDULE

3.3.1 Traffic Control

Traffic Control will be measured for payment on a lump sum basis as indicated on the Bid Form. Traffic Control shall be performed in accordance with the current additions of the Manual of Uniform Traffic Control Devices and the Georgia Department of Transportation Standards and Specifications. Construction barrels shall be installed on the shoulders of all roads and streets that have no curb and gutter prior to construction and maintained until the completion of the work. Traffic cones shall be used to channelize traffic around the immediate work area. Construction barrels and cones shall be removed within thirty (30) days of the completion of the work on each road. Payment for Traffic Control shall include all compensation for preparation of Traffic Control Plan, obtaining permits, installation and maintenance of traffic control signs and devices, and implementation of traffic control plan. Traffic control also includes installation and maintenance of temporary tape markers placed at not more than 80 feet apart, and temporary striping, as required, and other related work.

3.3.2 Grading Complete

Grading Complete will be measured for payment on the basis of horizontal linear feet as indicated on the Bid Form. Grading Complete consists of providing, placing and compacting earth material on the existing shoulders of the roadway to eliminate the drop-off at the edge of the pavement as a result of the resurfacing. The shoulders shall be constructed as shown on the drawings and as directed by the Engineer using earth material suitable for growing the required grass and free of large roots, debris and stone. Dirt "clods" and other undesirable material shall be removed from the shoulders and slopes after construction and the areas cleaned and dressed on each road before grassing and starting shoulder construction on other roads. No earth material shall be place on the shoulders and slopes where excessive amounts of cement, soil cement, asphalt and other debris are present as determined by the engineer.

3.3.3 Mill Asphaltic Concrete Pavement

Mill Asphaltic Concrete Pavement of various thickness indicated on the Bid Form will be measured for payment on a square yard basis. Payment includes all labor, materials and equipment required to complete milling of asphaltic concrete, removal and disposal of millings, and clean-up of site at locations indicated on the Plans. Mill Asphaltic concrete pavement shall comply with GDOT requirements.

3.3.4 Asphaltic Concrete Base and Wearing Courses

Asphaltic Concrete Base and Wearing Courses of various types indicated on the Bid Form, will be measured for payment on a per ton basis for authorized pavement construction. Payment includes all labor, materials and equipment, and placement and compaction of asphaltic cement to the lines and grades indicated on the Plans and in accordance with GDOT requirements.

3.3.5 Bituminous Tack Coat

Bituminous Tack Coat will be measured for payment on a per Gallon basis for authorized placement of material. Payment includes all labor, materials and equipment, and placement of bituminous materials in accordance with GDOT requirements.

3.3.6 Adjustment of Manholes and Valve Boxes to Grade

Adjustment of Manholes and Valve Boxes to Grade for the various types or conditions indicated on the Bid Form will Each be measured for payment. Payment includes all labor, materials and equipment, necessary to raise utility manhole and valve box access covers finished pavement elevation or finished grade outside of paved surfaces. Work shall be completed in accordance with GDOT requirements.

3.3.7 Traffic Striping and Markings

Traffic Striping of various types indicated on the Bid Form, will be measured for payment on the basis of horizontal linear feet or as otherwise indicated on the Bid Form. Payment includes all labor, materials and equipment, and placement of temporary markings and permanent traffic striping and markings in accordance with GDOT requirements.

3.3.8 Temporary/Permanent Grassing

Authorized grassing of various types indicated on the Bid Form will be measured for payment on the basis of horizontal area in acres (AC). Payment for authorized grassing shall be full compensation for grassing, complete, including ground preparation, seeding, sprigging, fertilizing, mulching, watering and related work to establish vegetation over a minimum for 85-percent coverage of surfaces.

3.3.9 Remove Speed Bumps

Speed Bump Removal will be measured for payment on a per Each basis for actual number of speed bumps removed. Payment includes all labor, materials and equipment, necessary to remove speed bumps and the removal and proper disposal of construction debris.

-- End of Section --

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TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 AVAILABILITY AND USE OF UTILITY SERVICES

1.1.1 Payment for Utility Services

The Owner will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be paid for by the Contractor at prevailing rates charged by the utility provider.

1.2 SANITATION

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Engineer. Owner toilet facilities will not be available to Contractor's personnel.

1.3 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Engineer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, pilot vehicles, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads shall interfere as little as possible with public traffic.

1.3.1 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

-- End of Section --

Technical Specifications

(GDOT Standard Specifications)

Section	Title
SS300	General Specifications for Base and Subbase Courses
SS400	Hot Mix Asphaltic Concrete Construction
SS402	Hot Mix Recycled Asphaltic Concrete
SS432	Mill Asphaltic Concrete Pavement
SS611	Relaying, Reconstructing, or Adjusting to Grade of Miscellaneous Roadway Structures
SS653	Thermoplastic Traffic Stripe
SS800	Coarse Aggregate
SS802	Aggregates for Asphaltic Concrete
SS820	Asphalt Cement
SS828	Hot Mix Asphaltic Concrete Mixtures
SS883	Mineral Filler

GDOT Bulletin dated October 24, 2018 (Addendum No. 1)

Section 300—General Specifications for Base and Subbase Courses

300.1 General Description

This Specification applies to all base and subbase courses, except asphaltic concrete. Additional requirements for each type of base and subbase are described in the appropriate Sections for specific base and subbase type construction.

300.1.01 Definitions

General Provisions 101 through 150.

300.1.02 Related References

A. Standard Specifications

Section 106—Control of Materials

Section 107—Legal Regulations and Responsibility to the Public

Section 109—Measurement and Payment

Section 150—Traffic Control

Section 152—Field Laboratory Building

Section 160—Reclamation of Material Pits and Waste Areas

Section 205—Roadway Excavation

Section 206—Borrow Excavation

Section 209—Subgrade Construction

Section 301—Soil-Cement Construction

Section 302—Sand-Bituminous Stabilized Base Course

Section 310—Graded Aggregate Construction

Section 316—Cement Stabilized Graded Aggregate Construction

Section 412—Bituminous Prime

Section 831—Admixtures

B. Referenced Documents

Form OMR-TM-141 Daily Truck Weights

Form 474 Tally Sheet

300.1.03 Submittals

General Provisions 101 through 150.

300.2 Materials

Find the Specifications for materials to be used and the references for them under the appropriate Section for each base and subbase type construction.

Ensure that each material meets the requirements for the type specified. Incorporate only materials that meet the Engineer's approval.

Admixtures meeting the requirements of Subsection 831.2.03 and approved for use in stabilized bases or subbases shall be governed by the requirements as outlined in Laboratory Standard Operating Procedure No. 5, Quality Control of Portland Cement and Blended Hydraulic Cements and Quality Control of Fly Ash and Granulated Blast-Furnace Slag.

A. Selecting Local Materials at the Source

The Engineer has the authority to classify materials at the source and require the materials to be excavated in the proper sequence so that each kind will reach its destination at the best location for that material in the finished work. The Engineer has the authority to reject any unsuitable materials.

B. Sources of Local Materials Outside the Right-of-Way

Follow the provisions of Subsection 106.10, "Local Material Sources" to obtain materials from local sources outside the right-of-way.

300.2.01 Delivery, Storage, and Handling

A. Storing at Central Mix Plants

Store material at a plant site with enough space for separate stockpiles, bins, or stalls for each size of aggregate. Keep aggregates separated until delivery to the plant feeders for proportioning. Keep the storage yard neat and the stockpiles, bins, and stalls accessible for obtaining samples.

300.3 Construction Requirements

300.3.01 Personnel

Supply all personnel and equipment necessary for obtaining samples from base plants and delivering them to the plant laboratory.

300.3.02 Equipment

Ensure that all equipment for constructing base and subbase courses is of an approved design and in satisfactory condition before construction begins. The equipment required for each type of base or subbase will be determined according to the construction method used.

A. Central Mix Plants

The central mixing plant will not be approved for proportioning, batching, or mixing unless a field laboratory meeting the requirements of Section 152 is available for the exclusive use of the Engineer or Inspector.

Design, coordinate, and operate plants so that the mixture is produced within the specified tolerances. The requirements are as follows.

1. Scales

   Before any mixture is delivered to the Project, check all scales with standard weights for accuracy and for agreement with each other.

   If weight proportioning is used, provide accurate scales so all ingredients of the mixture can be weighed separately. Use scales that are accurate to within 0.5 percent of the measured load. Support scales with rigid supports so that vibration from the plant does not interfere with accurate readings.

   a. Weight Box and Hopper Scales

      Use springless dial scales of a standard make and design for weight boxes and hopper. Inspect and seal scales when the Engineer determines it necessary to assure accuracy. Ensure that at least ten 50 lb. (25 kg) weights are available for testing the scales.

   b. Motor Truck Scales

With each plant, include a motor truck scale with a platform large enough to accommodate the entire length of any vehicle used. Ensure that the scale is certified according to Section 109 and is large enough to weigh the largest anticipated load. Do not measure weights greater than the rated capacity of the scales.

Ensure that the weights of the aggregate batches in the truck before delivery to the Project are within two percent of the sum of the weights of the batch ingredients.

Complete Forms OMR-TM-141 (Daily Truck Weights) and Form 474 (Tally Sheet) for each day's production and submit them to the Engineer.

2. Mixer

Equip each central mix plant with an approved mixer.

If Portland cement is required, begin mixing immediately after the cement is added to the coarse aggregate and soil mortar. Continue mixing until a homogeneous and uniform mixture is produced.

If the equipment does not produce a homogeneous and uniform mixture that meets these Specifications, the Engineer will require the Contractor to make the changes necessary to accomplish this result.

Any adjustments made to the charge in a batch mixer or the rate of feed to a continuous mixer must ensure a complete mix of all of the material.

Correct dead areas in the mixer where the material does not move or is not sufficiently agitated, by reducing the volume of material or by making other adjustments.

3. Mixture Proportioning

Add Portland cement, bituminous materials, aggregates, or other ingredients in such a manner that they are uniformly distributed throughout the mixture during the mixing operation.

4. Water Proportioning

In all plants, proportion water by weight. Provide a means for the Engineer to verify the amount of water per batch or the rate of flow for continuous mixing.

Use spray bars to evenly distribute moisture throughout the mixture.

5. Sampling

Use sampling equipment approved by the Engineer to obtain samples before combining them with other ingredients or introducing them into the mixer.

Use sampling equipment to provide an accurate representation of the furnished material.

6. Additional Requirements for Continuous-Mixing Plants

a. Feeder System

Continuous mixing plants shall use a feeder system that accurately proportions aggregate from each bin by weight.

Equip each feeder with a device that can change the quantity of material being fed. Use a feeder with adjustments that can be securely fastened.

Ensure that the plant has an interlocking system of feeders and conveyors that can be synchronized to supply a continuous flow of aggregate, including a positive flow of dry and liquid additives for mixing.

Provide an electronic belt-weighing device to monitor the combined aggregates. Ensure that there are meters for maintaining the aggregates and additives at varying production rates.

Use an electronic control package capable of tracking which accepts a signal from the belt-weighing device and signals to continuously vary the dry and liquid additive feeder speed and maintain the feed rate.

Proportion dry additives with a gravimetric (depleting weight) system meeting the following requirements:

- The dry additive gravimetric (depleting weight) system includes an isolation vessel supported by load cells independent of the fines silo.
- Use load cells in conjunction with an electronic scale package having remote digital display and the necessary controls. Continuously weigh the material being metered with a positive displacement feeder mounted on the discharge of the isolation vessel.

b. Control System

Use a control package that has a plant interlock shutdown capability. Plants must be able to shut down if actual flow rates differ from desired flow rates excessively. If the flow rate deviates excessively, an alarm shall sound at any of the aggregate, dry additive, or liquid additive metering devices.

Provide a monitoring station to control the entire operation that shows continuous quantitative data on the production and proportioning of the mix ingredients.

a. Portable Power Units

Equip plants that use portable electric power generators with a frequency meter (graduated and accurate to one hertz) and a voltmeter (graduated and accurate to two volts), installed in the power circuit.

b. Mixer

Use a mixer equipped with enough paddles or blades to produce a uniform and homogeneous mixture. Replace paddle blades that show more than 25 percent wear in the face area. Use paddles that can be adjusted to angular positions on the shafts and that can be reversed to retard the flow of the mix. Keep the mixer level.

c. Surge Hopper

Equip the mixer with a surge hopper. Use a surge hopper that automatically discharges the mixture when it reaches a predetermined level.

7. Additional Requirements For Batch-Mixing Plants

a. Weigh Box or Hopper

Use weigh boxes and hoppers that are suspended on scales, large enough to hold a full batch without spilling or needing hand raking, and equipped with a device for accurately weighing each size of aggregate.
Provide a convenient and accurate means of obtaining samples of aggregates from each bin before the material enters the mixing chamber. Equip each bin compartment with a bin level indicator that automatically stops weighing when a bin is empty.

b. Mixer

Include an approved, leak-proof batch mixer in the plant. Use a mixer fast enough or equipped with enough paddles or blades to produce a properly and uniformly mixed batch. Replace paddles and blades that show more than 25 percent wear in the face area.

a. Weighing Cement

Weigh cement on scales separate from the aggregate batching scales. Ensure that all scales meet the requirements of Section 109.

d. Proportioning Bituminous

Introduce bituminous material into the mixer through spray bars and weigh it on scales separate from the aggregate batching scales.

e. Control of Mixing Time

Use a time-locking device that automatically limits mixing time. Do not mix materials less than 30 seconds.

B. In-Place Mixers

For in-place mixing operations, use mixers that meet the following requirements:

1. Multiple Pass Mixers

   Use approved rotary-type multiple pass mixers with sufficient tines that mix cement, soil or soil-aggregate, and water uniformly for the full depth of the course.

2. Traveling Plant Mixers

   Use approved traveling mixing plants to pick up the aggregate, soil, or other materials from the windrow or roadway. Use plants equipped with a bottom shell or pan that pick up and mix the material while it is separated from the foundation material during at least 50 percent of the mixing cycle.

   Use plants that mix the material for the full depth of the section. Ensure that travelling plants move forward with successive increments the length and width of the roadbed so that the roadbed is compacted and finished in one operation. Ensure that none of the materials being mixed are lost or segregated.

   Use plants mounted on wheels or crawler tracks wide enough so that they will not rut or damage the mixed surface when loaded to capacity.

   Use plants with a pressurized metering device that introduces water during mixing.

   Ensure that devices for proportioning water and materials to be mixed accurately measures the specified amounts while the machine is in motion.

   For bituminous stabilization, use plants equipped with a metering device that accurately measures the bituminous material into the mixer within the tolerances specified in Section 302.3.05.B. Ensure that the meter indicator dial has a scale with divisions indicating gallons (liters).

   If mixing equipment does not produce a homogeneous and uniform mixture, make the changes necessary to produce this result, as required by the Engineer.

C. Mechanical Cement Spreader

When the material is to be mixed in-place, use an approved mechanical cement spreader to uniformly and accurately spread the cement. Do not use pneumatic tubes to transfer the cement from the tanker to the material to be stabilized.

D. Mixture Spreader

Use an approved mechanical spreader that meets the following requirements to uniformly spread the mixture:

- A height-adjustable strike-off plate to obtain the specified thickness of the finished base
- A self-propelled spreader with rollers to contact the truck tires and push the truck without skewing the spreader or truck
- A hopper large enough to prevent spilling or wasting the material

E. Static Rollers

Use static rollers that meet the following requirements. Use self-propelled static rollers on cement stabilized base.

1. Trench Roller

   In this context, “roller” describes a wheel made of a flat metal surface; “wheel” describes a rubber wheel of the automotive type.

   When base widening is specified, use at least one trench roller. Use a trench roller that has a guiding roller or wheel that operates in tandem with the compression roller on the area to be compacted or with the auxiliary wheel or roller.

   Ensure that the trench roller is equipped with an auxiliary wheel or roller, mounted on a height-adjustable axle. The contact surface of the auxiliary wheel or roller must be adjustable to at least 10 in (250 mm) above and 2 in (50 mm) below the rolling plane of the compression roller. If this adjustment is not sufficient to compact the subgrade to the Plan elevation, adjust the contact surface the necessary amount.

   If the steering roller or wheel operates in tandem with the auxiliary wheel or roller, it does not need to be height-adjustable.

Ensure that the auxiliary wheel or roller operates on the surface of the pavement adjacent to the area to be compacted, and at a distance from the edge of the pavement that no damage occurs. Keep the height adjustment of the auxiliary wheel or roller such that the compression roller will develop a smooth, compacted surface true to crown.

Use gas-propelled trench rollers equipped with reversing, smooth operating friction clutches. Ensure that friction clutches have smooth operating brakes of ample capacity. Use either hand-powered or power-operated steering devices.

The compression per inch (25 mm) width of compression roller shall not be less than 300 lbs (545 kg) and not greater than 365 lbs (660 kg). If necessary, use a hollow compression roller and secure the minimum weight with liquid ballast. The trench roller must compact a minimum width of at least 15 in (375 mm).

Fit rollers with adjustable spring scrapers that can scrape in both directions.

2. Steel-Wheel Rollers

   Use three-wheel or tandem steel-wheel rollers. Use self-propelled rollers equipped with cleaning devices to prevent material from adhering to the wheels.

   For base or subbase materials, use 3-wheel rollers on base or subbase materials that have a minimum weight of 10 tons (9 Mg) and a minimum compression of 325 pounds per inch (580 kg/100 mm) of width for the rear wheels.

   Use steel wheel tandem rollers with a minimum weight of 10 tons (9 Mg) and a minimum compression of 225 pounds per inch (400 kg/100 mm) of width for the rear drum.

3. Pneumatic-Tire Rollers

   Use pneumatic-tire rollers with a minimum contact pressure of 50 psi (345 kPa) per wheel.

   Equip rollers to uniformly distribute the load between all wheels.

   Use multiple axle, multiple wheel rollers with wheels staggered on the axles and spaces between each wheel to provide uniform compaction for the full compacting width of roller.

   Ensure that the air pressure of any tire does not vary more than 5 psi (35 kPa) from the established pressure.

   Operate rollers between 3 mph (5 kph) and 8 mph (13 kph), unless otherwise directed by the Engineer.

4. Sheepsfoot Rollers

   Use vibratory or static compaction sheepsfoot rollers of sufficient size and weight to obtain the desired compaction.

F. Vibratory Rollers

Use an approved vibratory roller designed to activate the frequency of vibration and the roller movement separately. Ensure that the weight and amplitude of the roller can compact the surface to Specifications with a minimum number of passes.

G. Bituminous Sampling Valve

Use bituminous transfer pumps that include a valve for sampling bituminous materials.

H. Fine Grading Machine

Specifications for the Fine Grading Machine are included in either a Special Provision or a Supplemental Specification in the Proposal or in the current Supplemental Specification book.

300.3.03 Preparation

A. Alternate Methods

When alternate methods of construction are provided without restriction, the Contractor may select these alternate methods at will, provided the equipment and organization are suited to the method selected. Before starting construction, discuss the proposed method with the Engineer. The method selected must:

- Spread base or subbase material uniformly without damaging the subgrade, subbase, or the material being placed
- Mix the materials until they are homogeneous
- Use the specified water and cement or bitumen content
- Compact throughout the depth of the course to the density specified
- Complete the work within the specified time limits

Organize the work and equipment so that spreading, compacting, and finishing the base or subbase is a continuous operation. Do not exceed minimum or maximum time limits where the detailed Specifications require them, except in unusual cases where permitted by the Engineer.

B. Preparing the Pit Site

Remove grass, weeds, roots, and other debris from local materials pits. Adhere to the requirements of Subsection 107.23, "Environmental Considerations" when performing this work. Include the cost in the prices bid for the pertinent Pay Items. This work is not considered as clearing and grubbing.

C. Preparing the Subgrade

If the subgrade does not meet the requirements of Section 209 for surface, compaction, and stability, repair all defective portions until it meets the requirements of that Section. Remove unsuitable materials and replace with acceptable material, if necessary. Compact the subgrade as specified in Section 209.

Have enough prepared subgrade meeting the requirements of Section 209 for at least one day of base construction before beginning work.

D. Preparing the Subbase

If a subbase is required, prepare it according to the requirements for surface and compaction. Ensure that it is stable enough to support the equipment that will place the base material without rutting or pumping. Repair all defective portions and replace any unsuitable material with acceptable material, if the subbase does not meet the requirements of the Specifications.

300.3.04 Fabrication

General Provisions 101 through 150.

300.3.05 Construction

A. Draining and Leaving Materials Pits

Keep materials pits well drained while materials are being removed from them. After removing materials, leave pits in the condition required by Section 106 and Section 160.

B. Mining and Mixing in a Pit

Mine all local materials pits within the pit boundaries and grid depths established by the Engineer.

Mine all materials from top to bottom. Mix materials in the pit before hauling to the roadbed or plant.

Place materials in windrows or stockpiles with a dragline or backhoe. Blend the gradation and moisture strata from each pit to a uniform mixture.

When a rim ditch is required and its depth exceeds the specified grid depth of soil-cement material, include only the material above the grid depth as base material. Use this material for the windrow or stockpile of material to be used for soil-cement base unless the Engineer determines that below-the-grid material is satisfactory.

Only use ladder pans and scrapers for stockpiling and windrowing in pits that are less than 18 in (450 mm) deep.

After the preliminary mixing, prevent the coarse materials from segregating from the fine materials with loading equipment that continues to blend the material.

C. Placing Materials

1. Mixture Control

   The Engineer will determine the proportions of the materials to be used in compounding the base or subbase. The Engineer will determine the analysis basis of the components.

   Change the mix, if required by the Engineer, to ensure that the finished base meets the requirements of these Specifications.

2. Moisture Control

   Control the moisture content according to the specified requirements for each type of base or subbase.

   Add water uniformly, allow it to evaporate or aerate, and roll the materials as often as necessary, to control the moisture content within the limits specified.

3. Number of Courses

   Because the maximum thickness of base or subbase materials to be mixed or spread in one course varies with the equipment used, it is subject to the Engineer's approval. Ensure that the thickness meets the requirements of Subsection 300.3.05.C.5, "Compaction."

4. Widening Work

   Ensure that widening work conforms to Section 150.

   When widening in traffic areas, excavate an area that can be completed in the same day.

   When widening pavement on which there is traffic on both sides, stagger operations to keep the widening trench open in one lane of traffic at a time.

5. Compaction

   Compact the entire thickness of all bases and subbases to the specified maximum dry weight per cubic foot (meter), as determined by the method specified in the Section for each base or subbase.

   If any base or subbase is more than 6 in (150 mm) thick, construct according to the following table for layer thickness:

Material	Layer Thickness
Topsoil, Sand-Clay, or Chert	Two equal layers, or one layer not to exceed 8 in (200 mm)
Graded Aggregate	Two equal layers, or one layer not to exceed 8 in (200 mm)
Cement Stabilized Graded Aggregate	Two equal layers, or one layer not to exceed 8 in (200 mm)
Cement Stabilized Soil Aggregate	Two equal layers, or one layer not to exceed 8 in (200 mm)
Sand Bituminous	Two equal layers, or one layer not to exceed 8 in (200 mm)
Soil-Cement	One layer not to exceed 8 in (200 mm)

D. Meeting Surface Requirements

Produce a smooth, uniform surface that complies with these Specifications.

Rebuild any areas that do not meet the requirements or remove or add material to the area until the Engineer approves of the Work.

300.3.06 Quality Acceptance

A. Monitoring Quality Control

Ensure that the mixture and the materials used meet the following quality controls:

- Before producing any mixture for the Project, calibrate the electronic sensors, devices, or settings for proportioning all mixture ingredients by scale weight. Calibrate in the presence of the Engineer, the proportioning of every ingredient for all rates of production.
- Maintain a dated, written record of the most recent calibration. Post the calibration at the base plant and make the record available for the Engineer's inspection at all times. Format records as graphs, tables, charts, or mechanically prepared data. If the material changes, the rate of production changes by more than +/- 20%, the plant is not producing base material for more than two weeks, or if a component affecting the ingredient proportions has been repaired, replaced, or adjusted, check and recalibrate the proportions.
- Verify the moisture of the mixture being produced. Perform checks on ingredient proportioning and verify truck weight as directed by the Engineer.

  Provide quality control personnel and all necessary equipment to perform and document moisture tests. Perform moisture tests at a frequency of at least one test per hour of base plant production.

B. Repairing Defects

During construction: If materials that do not meet these Specifications are placed on the roadway at any time during construction, remove and replace them with acceptable materials as a part of the Pay Item for the base or subbase being constructed.

After construction: Promptly correct defects discovered in the surface finish, thickness, or compaction of the completed base or subbase before The Work is accepted.

- If the base, subbase, or shoulders are deficient in thickness and it is determined that the subgrade elevation is high, remove the materials, lower the subgrade, and reconstruct the course, according to these Specifications at no cost to the Department.
- If job conditions permit and the Engineer mandates, correct areas deficient in thickness by raising the elevation of the surface or adding material to the course.
- In other cases, the Engineer may determine that the defective portions must be entirely removed. Add, mix, spread, and compact new material according to the Specifications and at no cost to the Department.
- If a surface is less than 3 in (75 mm) deep, scarify the area to a depth of at least 3 in (75 mm), except in the case of stabilized bases or subbases. Mix and compact the new and old materials.
- Repair stabilized bases or subbases according to Section 301, Section 302, Section 310, or Section 316, whichever is applicable.

300.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

300.4 Measurement

Base and Subbase courses will be measured in accordance with the Specification Section for the item.

Bituminous prime will not be measured for separate payment.

300.4.01 Limits

General Provisions 101 through 150.

300.5 Payment

Base and Subbase courses will be paid for in accordance with the Specification Section for the item. Include the cost of furnishing and applying bituminous prime in the Unit Price Bid for each individual Base Item according to the applicable provisions of Section 412.

No separate payment will be made for adding water or for aerating or rolling for the purpose of adding water. Include the cost of controlling moisture content in the prices bid for the pertinent Pay Items.

Separate payment will be made only for clearing and grubbing listed in the Proposal or required in the Plans and designated a Pay Item by the Engineer.

No separate payment will be made for stripping excavation unless shown on the Plans and included in the Proposal as a Pay Item.

300.5.01 Adjustments

If the Contractor for the subbase or base is responsible for the subgrade under another Pay Item, no additional payment will be made for any repairs made to the subgrade, except as provided in Section 209.

If another party (not the Contractor) is responsible for the subgrade, removing unsuitable materials will be paid for according to the Earthwork Item in the Contract.

Include compaction, scarification, and any other preparation necessary for the subgrade in the Unit Price Bid for the pertinent base course.

Section 400—Hot Mix Asphaltic Concrete Construction

400.1 General Description

This work includes constructing one or more courses of bituminous plant mixture on the prepared foundation or existing roadway surface. The mixture shall conform with lines, grades, thicknesses, and typical cross sections shown on the Plans or established by the Engineer.

This section includes the requirements for all bituminous plant mixtures regardless of the gradation of the aggregates, type and amount of bituminous material, or pavement use.

Work will be accepted on a lot-to-lot basis according to the requirements of this Section and Section 106.

400.1.01 Definitions

Segregated Mixture: Mixture which lacks homogeneity in HMA constituents of such a magnitude that there is a reasonable expectation of accelerated pavement distress or performance problems. May be quantified by measurable changes in temperature, gradation, asphalt content, air voids, or surface texture.

New Construction: A roadway section more than 0.5 mile (800 m) long that is not longitudinally adjacent to the existing roadway. If more than one lane is added, and any of the lanes are longitudinally adjacent to the existing lane, each lane shall be tested under the criteria for a resurfacing project.

Trench Widening: Widening no more than 4 ft. (1.2 m) in width.

Comparison sample: Opposite quarter of material sampled by the Contractor.

Quality assurance sample: Independent sample taken by the Department.

Referee sample: A sample of the material remaining after quartering which is used for evaluation if a comparison of Contractor and Departmental test results is outside allowable tolerances.

400.1.02 Related References

A. Standard Specifications

Section 106—Control of Materials

Section 109—Measurement and Payment

Section 152—Field Laboratory Building

Section 413—Bituminous Tack Coat

Section 424—Bituminous Surface Treatment

Section 802—Coarse Aggregate for Asphaltic Concrete

Section 828—Hot Mix Asphaltic Concrete Mixtures

B. Referenced Documents

AASHTO T 209

AASHTO T 202

AASHTO T 49

Laboratory Standard Operating Procedure (SOP) 27, “Quality Assurance for Hot Mix Asphaltic Concrete Plants in Georgia”

Department of Transportation Standard Operating Procedure (SOP) 15

GDT 38

GDT 73

GDT 78

GDT 83

GDT 93

GDT 119

GDT 125

GSP 15

GSP 21

QPL 1

QPL 2

QPL 7

QPL 26

QPL 30

QPL 39

QPL 41

QPL 45

QPL 65

QPL 67

QPL 70

QPL 77

400.1.03 Submittals

A. Invoices

When the Department requests, furnish formal written invoices from a supplier for all materials used in production of HMA. Show the following on the Bill of Lading:

- Date shipped
- Quantity in tons (megagrams)
- Included with or without additives (for asphalt cement)

Purchase asphaltic cement from a supplier who will provide copies of Bill of Lading upon the Department’s request.

B. Paving Plan

Before starting asphaltic concrete construction, submit a written paving plan to the Engineer for approval. Include the following on the paving plan:

- Proposed starting date
- Location of plant(s)
- Rate of production
- Average haul distance(s)
- Number of haul trucks
- Paver speed feet (meter)/minute for each placement operation
- Mat width for each placement operation
- Number and type of rollers for each placement operation
- Sketch of the typical section showing the paving sequence for each placement operation
- Electronic controls used for each placement operation
- Temporary pavement marking plan

If staged construction is designated in the Plans or contract, provide a paving plan for each construction stage.

If segregation is detected, submit a written plan of measures and actions to prevent segregation. Work will not continue until the plan is submitted to and approved by the Department.

C. Job Mix Formula

After the Contract has been awarded, submit to the Engineer a written job mix formula proposed for each mixture type to be used based on an approved mix design. Furnish the following information for each mix:

- Specific project for which the mixture will be used
- Source and description of the materials to be used
- Mixture I.D. Number
- Proportions of the raw materials to be combined in the paving mixture
- Single percentage of the combined mineral aggregates passing each specified sieve
- Single percentage of asphalt by weight of the total mix to be incorporated in the completed mixture
- Single temperature at which to discharge the mixture from the plant
- Theoretical specific gravity of the mixture at the designated asphalt content
- Name of the person or agency responsible for quality control of the mixture during production

Do the following to have the formulas approved and to ensure their quality:

1. Submit proposed job mix formulas for review at least two weeks before beginning the mixing operations.

2. Do not start hot mix asphaltic concrete work until the Engineer has approved a job mix formula for the mixture to be used. No mixture will be accepted until the Engineer has given approval.
3. Provide mix designs for all Superpave and 4.75 mm mixes to be used. The Department will provide mix design results for other mixes to be used.
4. After a job mix formula has been approved, assume responsibility for the quality control of the mixtures supplied to the Department according to Subsection 106.01, "Source of Supply and Quantity of Materials."

D. Quality Control Program

Submit a Quality Control Plan to the Office of Materials and Research for approval. The Quality Control Program will be included as part of the certification in the semiannual plant inspection report.

400.2 Materials

Ensure that materials comply with the specifications listed in Table 1.

Table 1—Materials Specifications

Material	Subsection
Asphalt Cement, Grade Specified	820.2
Coarse Aggregates for Asphaltic Concrete	802.2.02
Fine Aggregates for Asphaltic Concrete	802.2.01
Mineral Filler	883.1
Heat Stable Anti-Stripping Additive	831.2.04
Hydrated Lime	882.2.03
Silicone Fluid	831.2.05
Bituminous Tack Coat: PG 58-22, PG 64-22, PG 67-22	820.2
Hot Mix Asphaltic Concrete Mixtures	828
Fiber Stabilizing Additives	819

When required, provide Uintaite material, hereafter referred to by the common trade name Gilsonite, as a reinforcing agent for bituminous mixtures. Supply a manufacturer's certification that the Gilsonite is a granular solid which meets the following requirements:

Softening Point (AASHTO: T-53)	300-350 °F (150-175 °C)
Specific Gravity, 77 °F (25 °C) (AASHTO: T-228)	1.04 ± 0.02
Flash Point, COC (AASHTO: T-48)	550 °F (290 °C) Min.
Ash Content (AASHTO: T-111)	1.0% Max.
Penetration, 77 °F (25 °C), 100 gm., 5 sec. (AASHTO: T-49)	0

400.2.01 Delivery, Storage, and Handling

Storage of material is allowed in a properly sealed and insulated system for up to 24 hours except that Stone Matrix Asphalt (SMA), Open-Graded Friction Course (OGFC), or Porous European Mix (PEM) mixtures shall not be stored more than 12 hours. Mixtures other than SMA, OGFC, or PEM may be stored up to 72 hours in a sealed and insulated system, equipped with an auxiliary inert gas system, with the Engineer's approval. Segregation, lumpiness, or stiffness of stored mixture is cause for rejection of the mixture. The Engineer will not approve using a storage or surge bin if the mixture segregates, loses excessive heat, or oxidizes during storage.

The Engineer may obtain mixture samples or recover asphalt cement according to GDT 119. AASHTO T 202 and T 49 will be used to perform viscosity and penetration tests to determine how much asphalt hardening has occurred.

A. Vehicles for Transporting and Delivering Mixtures

Ensure that trucks used for hauling bituminous mixtures have tight, clean, smooth beds.

Follow these guidelines when preparing vehicles to transport bituminuous mixtures:

1. Use an approved releasing agent from QPL 39 in the transporting vehicle beds, if necessary, to prevent the mixture from sticking to the bed. Ensure that the releasing agent is not detrimental to the mixture. When applying the agent, drain the excess agent from the bed before loading.
2. Protect the mixture with a waterproof cover large enough to extend over the sides and ends of the bed. Securely fasten the waterproof cover before the vehicle begins moving.
3. Insulate the front end and sides of each bed with an insulating material with the following specifications:
    - Consists of builders insulating board or equivalent
    - Has a minimum "R" value of 4.0
    - Can withstand approximately 400 °F (200 °C) temperatures

    Install the insulating material so it is protected from loss and contamination.
4. Mark each transporting vehicle with a clearly visible identification number.
5. Create a hole in each side of the bed so that the temperature of the loaded mixture can be checked.

Ensure that the mixture is delivered to the roadway at a temperature within ± 20 °F (± 11 °C) of the temperature on the job mix formula.

If the Engineer determines that a truck may be hazardous to the Project or adversely affect the quality of the work, remove the truck from the project.

B. Containers for Transporting, Conveying, and Storing Bituminous Material

To transport, convey, and store bituminous material, use containers free of foreign material and equipped with sample valves. Bituminous material will not be accepted from conveying vehicles if material has leaked or spilled from the containers.

400.3 Construction Requirements

400.3. 01 Personnel

General Provisions 101 through 150.

400.3.02 Equipment

Hot mix asphaltic concrete plants that produce mix for Department use are governed by Quality Assurance for Hot Mix Asphaltic Concrete Plants in Georgia, Laboratory Standard Operating Procedure No. 27.

The Engineer will approve the equipment used to transport and construct hot mix asphaltic concrete. Ensure that the equipment is in satisfactory mechanical condition and can function properly during production and placement operations. Place the following equipment at the plant or project site:

A. Field Laboratory

Provide a field laboratory according to Section 152.

B. Plant Equipment

1. Scales

   Provide scales as follows:

   a. Furnish (at the Contractor's expense) scales to weigh bituminous plant mixtures, regardless of the measurement method for payment.

   b. Ensure that the weight measuring devices that provide documentation comply with Subsection 109.01, "Measurement and Quantities."

   c. When not using platform scales, provide weight devices that record the mixture net weights delivered to the truck. A net weight system will include, but is not limited to:

      - Hopper or batcher-type weight systems that deliver asphaltic mixture directly to the truck
      - Fully automatic batching equipment with a digital recording device

   d. Use a net weight printing system only with automatic batching and mixing systems approved by the Engineer.

   e. Ensure that the net weight scale mechanism or device manufacturer, installation, performance, and operation meets the requirements in Subsection 109.01, "Measurement and Quantities"

   f. Provide information on the Project tickets according to Department of Transportation SOP-15.

2. Time-Locking Devices

   Furnish batch type asphalt plants with automatic time-locking devices that control the mixing time automatically. Construct these devices so that the operator cannot shorten or eliminate any portion of the mixing cycle.

3. Surge- and Storage-Systems

   Provide surge and storage bins as follows:

   a. Ensure that bins for mixture storage are insulated and have a working seal, top and bottom, to prevent outside air infiltration and to maintain an inert atmosphere during storage.

      Bins not intended as storage bins may be used as surge bins to hold hot mixtures for part of the working day. However, empty these surge bins completely at the end of the working day.

   b. Ensure that surge and storage bins can retain a predetermined minimum level of mixture in the bin when the trucks are loaded.

c. Ensure that surge and storage systems do not contribute to mix segregation, lumpiness, or stiffness.

4. Controls for Dust Collector Fines

   Control dust collection as follows:

   a. When collecting airborne aggregate particles and returning them to the mixture, have the return system meter all or part of the collected dust uniformly into the aggregate mixture and waste the excess. The collected dust percentage returned to the mixture is subject to the Engineer's approval.

   b. When the collected dust is returned directly to the hot aggregate flow, interlock the dust feeder with the hot aggregate flow and meter the flow to maintain a flow that is constant, proportioned, and uniform.

5. Mineral Filler Supply System

   When mineral filler is required as a mixture ingredient:

   a. Use a separate bin and feed system to store and proportion the required quantity into the mixture with uniform distribution.

   b. Control the feeder system with a proportioning device that meets these specifications:

      - Is accurate to within ± 10 percent of the filler required
      - Has a convenient and accurate means of calibration
      - Interlocks with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes

   c. Provide flow indicators or sensing devices for the mineral filler system and interlock them with the plant controls to interrupt the mixture production if mineral filler introduction fails.

   d. Add mineral filler to the mixture as follows, according to the plant type:

      - Batch Type Asphalt Plant. Add mineral filler to the mixture in the weigh hopper.
      - Continuous Plant Using Pugmill Mixers. Feed the mineral filler into the hot aggregate before it is introduced into the mixer so that dry mixing is accomplished before the bituminous material is added.
      - Continuous Plants Using the Drier-Drum Mixers. Add the mineral filler so that dry mixing is accomplished before the bituminous material is added and ensure that the filler does not become entrained into the air stream of the drier.

6. Hydrated Lime Treatment System

   When hydrated lime is required as a mixture ingredient:

   a. Use a separate bin and feed system to store and proportion the required quantity into the mixture.

   b. Ensure that the aggregate is uniformly coated with hydrated lime aggregate before adding the bituminous material to the mixture. Add the hydrated lime so that it will not become entrained in the exhaust system of the drier or plant.

   c. Control the feeder system with a proportioning device that meets these specifications:

      - Is accurate to within ± 10 percent of the amount required
      - Has a convenient and accurate means of calibration

- Interlocks with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes and to ensure that mixture produced is properly treated with lime

d. Provide flow indicators or sensing devices for the hydrated lime system and interlock them with the plant controls to interrupt mixture production if hydrated lime introduction fails.

7. Net Weight Weighing Mechanisms

Certify the accuracy of the net weight weighing mechanisms by an approved registered scale serviceperson at least once every 6 months. Check the accuracy of net weight weighing mechanisms at the beginning of Project production and thereafter as directed by the Engineer. Check mechanism accuracy as follows:

a. Weigh a load on a set of certified commercial truck scales. Ensure that the difference between the printed total net weight and that obtained from the commercial scales is no greater than 4 lbs/1,000 lbs (4 kg/Mg) of load.

Check the accuracy of the bitumen scales as follows:

- Use standard test weights.
- If the checks indicate that printed weights are out of tolerance, have a registered scale serviceperson check the batch scales and certify the accuracy of the printer.
- While the printer system is out of tolerance and before its adjustment, continue production only if using a set of certified truck scales to determine the truck weights.

b. Have plants that use batch scales maintain ten 50 lb (25 kg) standard test weights at the plant site to check batching scale accuracy.

Ensure that plant scales that are used only to proportion mixture ingredients, not to determine pay quantities, are within two percent throughout the range.

8. Fiber Supply System

When stabilizing fiber is required as a mixture ingredient:

a. Use a separate feed system to store and proportion by weight the required quantity into the mixture with uniform distribution.

b. Control the feeder system with a proportioning device that meets these Specifications:

- Is accurate to within ± 10 percent of the amount required. Automatically adjusts the feed rate to maintain the material within this tolerance at all times
- Has a convenient and accurate means of calibration
- Provide in-process monitoring, consisting of either a digital display of output or a printout of feed rate, in pounds (kg) per minute, to verify feed rate
- Interlocks with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes

c. Provide flow indicators or sensing devices for the fiber system and interlock them with the plant controls to interrupt the mixture production if fiber introduction fails or if the output rate is not within the tolerances given above.

d. Introduce the fiber as follows:

- When a batch type plant is used, add the fiber to the aggregate in the weigh hopper. Increase the batch dry mixing time by 8 to 12 seconds from the time the aggregate is completely emptied into the mixer to ensure the fibers are uniformly distributed prior to the injection of asphalt cement into the mixer.
- When a continuous or drier-drum type plant is used, add the fiber to the aggregate and uniformly disperse prior to the injection of asphalt cement. Ensure the fibers will not become entrained in the exhaust system of the drier or plant.

C. Equipment at Project Site

1. Cleaning Equipment

Provide sufficient hand tools and power equipment to clean the roadway surface before placing the bituminous tack coat. Use power equipment that complies with Subsection 424.3.02.F, "Power Broom and Power Blower."

2. Pressure Distributor

To apply the bituminous tack coat, use a pressure distributor that complies with Subsection 424.3.02.B, "Pressure Distributor."

3. Bituminous Pavers

To place hot mix asphaltic concrete, use bituminous pavers that can spread and finish courses that are:

- As wide and deep as indicated on the Plans
- True to line, grade, and cross section
- Smooth
- Uniform in density and texture

a. Continuous Line and Grade Reference Control. Furnish, place, and maintain the supports, wires, devices, and materials required to provide continuous line and grade reference control to the automatic paver control system.

b. Automatic Screed Control System. Equip the bituminous pavers with an automatic screed control system actuated from sensor-directed mechanisms or devices that will maintain the paver screed at a pre-determined transverse slope and elevation to obtain the required surface.

c. Transverse Slope Controller. Use a transverse slope controller capable of maintaining the screed at the desired slope within ± 0.1 percent. Do not use continuous paving set-ups that result in unbalanced screed widths or off-center breaks in the main screed cross section unless approved by the Engineer.

d. Screed Control. Equip the paver to permit the following four modes of screed control. The method used shall be approved by the Engineer.

- Automatic grade sensing and slope control
- Automatic dual grade sensing
- Combination automatic and manual control

- Total manual control

Ensure that the controls are referenced with a taut string or wire set to grade, or with a ski-type device or mobile reference at least 30 ft (9 m) long when using a conventional ski. A non-contacting laser or sonar-type ski with at least four referencing mobile stations may be used with a reference at least 24 ft. (7.3 m) long. Under limited conditions, a short ski or shoe may be substituted for a long ski on the second paver operating in tandem, or when the reference plane is a newly placed adjacent lane.

Automatic screed control is required on all Projects; however, when the Engineer determines that Project conditions prohibit the use of such controls, the Engineer may waive the grade control, or slope control requirements, or both.

e. Paver Screed Extension. When the laydown width requires a paver screed extension, use bolt-on screed extensions to extend the screeds, or use an approved mechanical screed extension device. When the screed is extended, add auger extensions according to the paver manufacturer's recommendations.

> **Note: Do not use extendible strike-off devices instead of approved screed extensions. Only use a strike-off device in areas that would normally be luted in by hand labor.**

4. Compaction Equipment

Ensure that the compaction equipment is in good mechanical condition and can compact the mixture to the required density. The compaction equipment number, type, size, operation, and condition is subject to the Engineer's approval

5. Materials Transfer Vehicle (MTV)
   a. Use a Materials Transfer Vehicle (MTV) when placing asphaltic concrete mixtures on Projects on the state route system with the following conditions:
      1) When to use:
         - The ADT is equal to or greater than 6000,
         - The project length is equal to or greater than 3000 linear feet (915 linear meters),
         - The total tonnnage (megagrams) of all asphaltic concrete mixtures is greater than 2000 tons (1815 Mg).
      2) Where to use:
         - Mainline of the traveled way
         - Collector/distributor (C/D) lanes on Interstates and limited access roadways
         - Leveling courses at the Engineer's discretion
   b. Ensure the MTV and conventional paving equipment meet the following requirements:
      1) MTV

- Has a truck unloading system which receives mixture from the hauling equipment and independently deliver mixtures from the hauling equipment to the paving equipment.
- Has mixture remixing capability by either a storage bin in the MTV with a minimum capacity of 14 tons (13 megagrams) of mixture and a remixing system in the bottom of MTV storage bin, or a dual pugmill system located in the paver hopper insert with two full length transversely mounted paddle mixers to continuously blend the mixture as it discharges to a conveyor system.
- Provides to the paver a homogeneous, non-segregated mixture of uniform temperature with no more than 20 °F(18 °C) difference between the highest and lowest temperatures when measured transversely across the width of the mat in a straight line at a distance of one foot to three feet from the screed while the paver is operating.

2) Conventional Paving Equipment

- Has a paver hopper insert with a minimum capacity of 14 tons (13 Mg) installed in the hopper of conventional paving equipment when an MTV is used.

c. If the MTV malfunctions during spreading operations, discontinue placement of hot mix asphaltic concrete after there is sufficient hot mix placed to maintain traffic in a safe manner. However, placement of hot mix asphaltic concrete in a lift not exceeding 2 in. (50 mm) may continue until any additional hot mix in transit at the time of the malfunction has been placed. Cease spreading operations thereafter until the MTV is operational.

d. Ensure the MTV is empty when crossing a bridge and is moved across without any other Contractor vehicles or equipment on the bridge. Move the MTV across a bridge in a travel lane and not on the shoulder. Ensure the speed of the MTV is no greater than 5 mph (8 kph) without any acceleration or deceleration while crossing a bridge.

400.3.03 Preparation

A. Prepare Existing Surface

Prepare the existing surface as follows:

1. Clean the Existing Surface. Before applying hot mix asphaltic concrete pavement, clean the existing surface to the Engineer's satisfaction.
2. Patch and Repair Minor Defects

   Before placing leveling course:

   a. Correct potholes and broken areas that require patching in the existing surface and base as directed by the Engineer.

   b. Cut out, trim to vertical sides, and remove loose material from the areas to be patched.

   c. Prime or tack coat the area after it has been cleaned. Compact patches to the Engineer's satisfaction. Material for patches does not require a job mix formula, but shall meet the gradation range shown in Section 828. The Engineer must approve the asphalt content to be used.
3. Apply Bituminous Tack Coat

Apply the tack coat according to Section 413. The Engineer will determine the application rate, which must be within the limitations Table 2.

Table 2—Application Rates for Bituminous Tack, gal/yd² (L/m²)

	Minimum	Maximum
Under OGFC and PEM Mixes	0.06 (0.270)	0.08 (0.360)
All Other Mixes	0.04 (0.180)	0.06(0.270)
*On thin leveling courses and freshly placed asphaltic concrete mixes, reduce the application rate to 0.02 to 0.04 gal/yd² (0.09 to 0.18 L/m²).		

B. Place Patching and Leveling Course

1. When the existing surface is irregular, bring it to the proper cross section and grade with a leveling course of hot mix asphaltic concrete materials.
2. Use leveling at the same Superpave Mix Design Level specified for the surface course except when leveling is no greater than 0.75 inch (19 mm).
3. Place leveling at the locations and in the amounts directed by the Engineer.
4. Use leveling course mixtures that meet the requirements of the job mix formulas defined in:
   - Subsection 400.3.05.A, "Observe Composition of Mixtures"
   - Section 828
   - Leveling acceptance schedules in Subsection 400.3.06.A, "Acceptance Plans for Gradation and Asphalt Cement Content"
5. If the leveling and patching mix type is undesignated, determine the mix type by the thickness or spread rate according to Table 3, but do not use 4.75 mm mix on interstate projects.

Table 3—Leveling and Patching Mix Types

Thickness	Rate of Spread	Type of Mix
Up to 0.75 in (19 mm)	Up to 85 lbs/yd² (45 kg/m²)	4.75 mm Mix or 9.5 mm Superpave (Level A)
0.75 to 1.5 in (19 to 38 mm)	85 to 165 lbs/yd²(45 to 90 kg/m²)	9.5 mm Superpave (Level B)
1.5 to 2 in (38 to 50 mm)	165 to 220 lbs/yd² (90 to 120 kg/m²)	12.5 mm Superpave *
2 to 3 in (50 to 75 mm)	220 to 330 lbs/yd² (120 to 180 kg/m²)	19 mm Superpave *
Over 3 in (75 mm)	Over 330 lbs/yd² (180 kg/m²)	25 mm Superpave

* These mixtures may be used for isolated patches no more than 6 in. (150 mm) deep and no more than 4 ft. (1.2 m) in diameter or length.

400.3.04 Fabrication

General Provisions 101 through 150.

400.3.05 Construction

Provide the Engineer at least one day's notice prior to beginning construction, or prior to resuming production if operations have been temporarily suspended.

A. Observe Composition of Mixtures

1. Calibration of plant equipment

   If the material changes, or if a component affecting the ingredient proportions has been repaired, replaced, or adjusted, check and recalibrate the proportions.

   Calibrate as follows:

   a. Before producing mixture for the Project, calibrate by scale weight the electronic sensors or settings for proportioning mixture ingredients.
   b. Calibrate ingredient proportioning for all rates of production.

2. Mixture control

   Compose hot mix asphaltic concrete from a uniform mixture of aggregates, bituminous material, and if required, hydrated lime, mineral filler, or other approved additive.

   Make the constituents proportional to produce mixtures that meet the requirements in Section 828. The general composition limits prescribed are extreme ranges within which the job mix formula must be established. Base mixtures on a design analysis that meets the requirements of Section 828.

   If control test results show that the characteristic tested does not conform to the job mix formula control tolerances given in Section 828, take immediate action to ensure that the quality control methods are effective.

   Control the materials to ensure that extreme variations do not occur. Maintain the gradation within the composition limits in Section 828.

B. Prepare Bituminous Material

Uniformly heat the bituminous material to the temperature specified in the job mix formula with a tolerance of ± 20 °F (± 10 °C).

C. Prepare the Aggregate

Prepare the aggregate as follows:

1. Heat the aggregate for the mixture, and ensure a mix temperature within the limits of the job mix formula.
2. Do not contaminate the aggregate with fuel during heating.
3. Reduce the absorbed moisture in the aggregate until the asphalt does not separate from the aggregate in the prepared mixture. If this problem occurs, the Engineer will establish a maximum limit for moisture content in the aggregates. When this limit is established, maintain the moisture content below this limit.

D. Prepare the Mixture

Proportion the mixture ingredients as necessary to meet the required job mix formula. Mix until a homogenous mixture is produced.

1. Add Mineral Filler

   When mineral filler is used, introduce it in the proper proportions and as specified in Subsection 400.3.02.B.5, "Mineral Filler Supply System."

2. Add Hydrated Lime

   When hydrated lime is included in the mixture, add it at a rate specified in Section 828 and the job mix formula. Use methods and equipment for adding hydrated lime according to Subsection 400.3.02.B.6, "Hydrated Lime Treatment System."

   Add hydrated lime to the aggregate by using Method A or B as follows:

   Method A—Dry Form—Add hydrated lime in its dry form to the mixture as follows, according to the type of plant:

   a. Batch Type Asphalt Plant: Add hydrated lime to the mixture in the weigh hopper or as approved and directed by the Engineer.

   b. Continuous Plant Using Pugmill Mixer: Feed hydrated lime into the hot aggregate before it is introduced into the mixer so that dry mixing is complete before the bituminous material is added.

   c. Continuous Plant Using Drier-Drum Mixer: Add hydrated lime so that the lime will not become entrained into the air stream of the drier and so that thorough dry mixing will be complete before the bituminous material is added.

   Method B—Lime/Water Slurry—Add the required quantity of hydrated lime (based on dry weight) in lime/water slurry form to the aggregate. This solution consists of lime and water in concentrations as directed by the Engineer.

   Equip the plant to blend and maintain the hydrated lime in suspension and to mix it with the aggregates uniformly in the proportions specified.

3. Add Stabilizing Fiber

   When stabilizing fiber is included in the mixture, add it at a rate specified in Section 819 and the Job Mix Formula. Introduce it as specified in Subsection 400.3.02.B.8, "Fiber Supply System."

4. Add Gilsonite Modifier

   When required, add the Gilsonite modifier to the mixture at a rate such that eight percent by weight of the asphalt cement is replaced by Gilsonite. Use either PG 64-22 or PG 67-22 asphalt cement as specified in Subsection 820.2.01. Provide suitable means to calibrate and check the rate of Gilsonite being added. Introduce Gilsonite modifier by either of the following methods.

   a. For batch type plants, incorporate Gilsonite into the pugmill at the beginning of the dry mixing cycle. Increase the dry mix cycle by a minimum of 10 seconds after the Gilsonite is added and prior to introduction of the asphalt cement. For this method, supply Gilsonite in plastic bags to protect the material during shipment and handling and store the modifier in a waterproof environment. The bags shall be capable of being completely melted and uniformly blended into the combined mixture.

Gilsonite may also be added through a mineral filler supply system as described in Subsection 400.3.02.B.5, "Mineral Filler Supply System." The system shall be capable of injecting the modifier into the weigh hopper near the center of the aggregate batching cycle so the material can be accurately weighed.

b. For drum drier plants, add Gilsonite through the recycle ring or through an acceptable means which will introduce the Gilsonite prior to the asphalt cement injection point. The modifier shall be proportionately fed into the drum mixer at the required rate by a proportioning device which shall be accurate within ± 10 percent of the amount required. The entry point shall be away from flames and ensure the Gilsonite will not be caught up in the air stream and exhaust system.

5. Avoid Materials from Different Sources

Do not use mixtures prepared from aggregates from different sources intermittently. This will cause the color of the finished pavement to vary.

E. Observe Weather Limitations

Do not mix and place asphaltic concrete if the existing surface is wet or frozen. Do not lay asphaltic concrete OGFC mix or PEM at air temperatures below 55 ºF (13 ºC). For other courses, follow the temperature guidelines in the following table:

Table 4—Lift Thickness Table

Lift Thickness	Minimum Temperature
1 in (25 mm) or less	55 °F (13 °C)
1.1 to 2 in (26 mm to 50 mm)	45 °F (8 °C)
2.1 to 3 in (51 mm to 75 mm)	35 °F (2 °C)
3.1 to 4 in (76 mm to 100 mm)	30 °F (0 °C)
4.1 to 8 in (101 mm to 200 mm)	Contractor's discretion

F. Perform Spreading and Finishing

Spread and finish the course as follows:

1. Determine the course's maximum compacted layer thickness by the type mix being used according to Table 5.

Table 5—Maximum Layer Thickness

Mix Type	Minimum Layer Thickness	Maximum Layer Thickness	Maximum Total Thickness
25 mm Superpave	3 in (75 mm)	5 in (125 mm) *	—
19 mm Superpave	1 3/4 in (44 mm)	3 in (75 mm) *	—
12.5 mm Superpave	1 3/8 in (35 mm)	2 1/2 in (62 mm)*	8 in (200 mm)
9.5 mm Superpave Levels	1 1/8 in.(28 mm)	2 in (50 mm)	4 in (100 mm)

Mix Type	Minimum Layer Thickness	Maximum Layer Thickness	Maximum Total Thickness
B, C, or D)			
9.5 mm Superpave Level A)	3/4 in (19 mm)	1 3/8 in (35 mm)	4 in (100 mm)
4.75 mm Mix	7/8 in (22) mm)	1 1/8 in (30 mm)	2 in (50 mm)
9.5 mm OGFC	55 lbs/yd² (30 kg/m²)	65 lbs/yd² (36 kg/m²)	—
12.5 mm OGFC	85 lbs/yd² (47 kg/m²)	95 lbs/yd² (53 kg/m²)	—
12.5 mm PEM	110 lbs/yd² (80 kg/m²)	165 lbs/yd² (90 kg/m²)	—
9.5 mm SMA	1 1/8 in (28 mm)	1 1/2 in (40 mm)	4 in (100 mm)
12.5 mm SMA	1 1/4 in (32 mm)	3 in (75 mm)	6 in (150 mm)
19 mm SMA	1 3/4 in (44 mm)	3 in (75 mm)	—
* Allow up to 6 in (150 mm) per lift on trench widening. Place 9.5 mm Superpave and 12.5 mm Superpave up to 4 in (100 mm) thick for driveway and side road transition.			

2. Unload the mixture into the paver hopper or into a device designed to receive the mixture from delivery vehicles.
3. Except for leveling courses, spread the mixture to the loose depth for the compacted thickness or the spread rate. Use a mechanical spreader true to the line, grade, and cross section specified.
4. For leveling courses, use a motor grader equipped with a spreader box and smooth tires to spread the material or use a mechanical spreader meeting the requirements in Subsection 400.3.02.C, "Equipment at Project Site."
5. Obtain the Engineer's approval for the sequence of paving operations, including paving the adjoining lanes. Minimize tracking tack onto surrounding surfaces.
6. Ensure that the outside edges of the pavement being laid are aligned and parallel to the roadway center line.
7. For Contracts that contain multiple lifts or courses, arrange the width of the individual lifts so that the longitudinal joints of each successive lift are offset from the previous lift at least 1 ft (300 mm). This requirement does not apply to the lift immediately over thin lift leveling courses.

   Ensure that the longitudinal joint(s) in the surface course and the mix immediately underneath asphaltic concrete OGFC are at the lane line(s).

NOTE: Perform night work with artificial light provided by the Contractor and approved by the Engineer.

8. Where mechanical equipment cannot be used, spread and rake the mixture by hand. Obtain the Engineer's approval of the operation sequence, including compactive methods, in these areas.
9. Keep small hand raking tools clean and free from asphalt build up. Do not use fuel oil or other harmful solvents to clean tools during the work.
10. Do not use mixture with any of these characteristics:

- Segregated
- Nonconforming temperature
- Deficient or excessive asphalt cement content
- Otherwise unsuitable to place on the roadway in the work

11. Remove and replace mixture placed on the roadway that the Engineer determines has unacceptable blemish levels from segregation, streaking, pulling and tearing, or other characteristics. Replace with acceptable mixture at the Contractor's expense. Do not continually place mixtures with deficiencies.

    Do not place subsequent course lifts over another lift or courses placed on the same day while the temperature of the previously placed mix is 140 °F (60 °C) or greater.

12. Obtain the Engineer's approval of the material compaction equipment. Perform the rolling as follows:
    a. Begin the rolling as close behind the spreader as possible without causing excessive distortion of the asphaltic concrete surface.
    b. Continue rolling until roller marks are no longer visible.
    c. Use pneumatic-tired rollers with breakdown rollers on all surface and subsurface courses except asphaltic concrete OGFC, PEM and SMA or other mixes designated by the Engineer.
13. If applicable, taper or "feather" asphaltic concrete from full depth to a depth no greater than 0.5 in (13 mm) along curbs, gutters, raised pavement edges, and areas where drainage characteristics of the road must be retained. The Engineer will determine the location and extent of tapering.

G. Maintain Continuity of Operations

Coordinate plant production, transportation, and paving operations to maintain a continuous operation. If the spreading operations are interrupted, construct a transverse joint if the mixture immediately behind the paver screed cools to less than 250 ºF (120 ºC).

H. Construct the Joints

1. Construct Transverse Joints
    a. Construct transverse joints to facilitate full depth exposure of the course before resuming placement of the affected course.
    b. Properly clean and tack the vertical face of the transverse joint before placing additional material.

    NOTE: Never burn or heat the joint by applying fuel oil or other volatile materials.

    c. Straightedge transverse joints immediately after forming the joint.
    d. Immediately correct any irregularity that exceeds 3/16 in. in 10 ft (5 mm in 3 m).
2. Construct Longitudinal Joints

    Clean and tack the vertical face of the longitudinal joint before placing adjoining material. Construct longitudinal joints so that the joint is smooth, well sealed, and bonded.
3. Construction Joint Detail for OGFC and PEM Mixtures

    In addition to meeting joint requirements described above, construct joints and transition areas for 12.5 mm OGFC and 12.5 mm PEM mixtures as follows:

a. For projects which do not have milling included as a pay item:

1) Place OGFC mixture meeting gradation requirements of 9.5 mm OGFC as specified in Section 828 on entrance and exit ramp gore areas and end of project construction joints.

- Taper mixture from 3/8 in (10 mm) at end of project to full plan depth within maximum distance of spread for one load of mixture
- Taper mixture placed on gore areas from thickness of the edge of the mainline to 3/8 in (10 mm) at the point of the ramp transverse joint.

2) Construct the ramp transverse joint at the point specified in the plans or as directed by the Engineer.

3) Mixture placed in the transition and gore areas will be paid for at the contract unit price for 12.5 mm OGFC or 12.5 mm PEM as applicable.

b. For projects which have milling included as a pay item:

1) Taper milling for a distance of no less than 50 ft (15 m) to a depth of 2 1/4 in (59 mm) at the point of the transverse joint

2) Taper thickness, if needed, of the dense-graded surface mix within the 50 ft (15 m) distance to 1 1/2 in (40 mm) at the point of the transverse joint

3) Taper thickness of the 12.5 mm OGFC or 12.5 mm PEM to 3/4 in (19 mm) so that it ties in at grade level with the existing surface at the point of the transverse joint

I. Protect the Pavement

Protect sections of the newly finished pavement from traffic until the traffic will not mar the surface or alter the surface texture. If directed by the Engineer, use artificial methods to cool the newly finished pavement to open the pavement to traffic more quickly.

J. Modify the Job Mix Formula

If the Engineer determines that undesirable mixture or mat characteristics are being obtained, the job mix formula may require immediate adjustment.

400.3.06 Quality Acceptance

A. Acceptance Plans for Gradation and Asphalt Cement Content

The Contractor will randomly sample and test mixtures for acceptance on a lot basis. The Department will monitor the Contractor testing program and perform comparison and quality assurance testing.

1. Determine Lot Amount

A lot consists of the tons (megagrams) of asphaltic concrete produced and placed each production day. If this production is less than 500 tons (500 Mg), or its square yard (meter) equivalent, production may be incorporated into the next working day. The Engineer may terminate a lot when a pay adjustment is imminent if a plant or materials adjustment resulting in a probable correction has been made. Terminate all open lots at the end of the month, except for materials produced and placed during the adjustment period. The lot will be terminated as described in Subsection 400.5.01,"Adjustments".

If the final day's production does not constitute a lot, the production may be included in the lot for the previous day's run; or, the Engineer may treat the production as a separate lot with a corresponding lower number of tests.

1. Determine Lot Acceptance

   Determine lot acceptance as found in Subsection 400.5.01, "Adjustments."

   The Department will perform the following task:

   Determine the pay factor by using the mean of the deviations from the job mix formula of the tests in each lot and apply it to Table 9—Mixture Acceptance Schedule for Surface Mixes or Table 10—Mixture Acceptance Schedule for Subsurface Mixes, whichever is appropriate. This mean will be determined by averaging the actual numeric value of the individual deviations from the job mix formula, disregarding whether the deviations are positive or negative amounts. Do not calculate lot acceptance using test results for materials not used in the Work. Determine the pay factor for each lot by multiplying the contract unit price by the appropriate pay factor from the Mixture Acceptance Schedule - Table 9 or Table 10. When two or more pay factors for a specific lot are less than 1.0, determine the adjusted payment by multiplying the contract unit price by the lowest pay factor.

   If the mean of the deviations from the job mix formula of the lot acceptance tests for a control sieve or for asphalt cement content exceeds the tolerances established in the appropriate Mixture Acceptance Schedule, and if the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer. If the Engineer determines that the material is not acceptable to leave in place, the materials shall be removed and replaced at the Contractor's expense.

3. Provide Quality Control Program

   Provide a Quality Control Program as established in SOP 27 which includes:

   - Assignment of quality control responsibilities to specifically named individuals who have been certified by the Office of Materials and Research
   - Provisions for prompt implementation of control and corrective measures
   - Provisions for communication with Project Manager, Bituminous Technical Services Engineer, and Testing Management Operations Supervisor at all times
   - Provisions for reporting all test results daily through the Office of Materials and Research computer Bulletin Board Service; other checks, calibrations and records will be reported on a form developed by the Contractor and will be included as part of the project records
   - Notification in writing of any change in quality control personnel

   a. Certification Requirements:

      - Use laboratory and testing equipment certified by the Department. (Laboratories which participate in and maintain AASHTO accreditation for testing asphaltic concrete mixtures will be acceptable in lieu of Departmental certification.)
      - Provide certified quality control personnel to perform the sampling and testing. A Quality Control Technician (QCT) may be certified at three levels:

1) Temporary Certification – must be a technician trainee who shall be given direct oversight by a certified Level 1 or Level 2 QCT while performing acceptance testing duties during the first 5 days of training. The trainee must complete qualification requirements within 30 production days after being granted temporary certification. A trainee who does not become qualified within 30 production days will not be re-eligible for temporary certification. A certified Level 1 or Level 2 QCT shall be at the plant at all times during production and shipment of mixture to monitor work of the temporarily certified technician.
2) Level 1 – must demonstrate they are competent in performing the process control and acceptance tests and procedures related to hot mix asphalt production and successfully pass a written exam.
3) Level 2 – must meet Level 1 requirements and must be capable of and responsible for making process control adjustments, and successfully pass a written exam.
    - Technician certification is valid for 3 years from the date on the technician's certificate unless revoked or suspended. Eligible technicians may become certified through special training and testing approved by the Office of Materials and Research. Technicians who lose their certification due to falsification of test data will not be eligible for recertification in the future unless approved by the State Materials and Research Engineer.

b. Quality Control Management

1) Designate at least one Level 2 QCT as manager of the quality control operation. The Quality Control Manager shall meet the following requirements:
    - Be accountable for actions of other QCT personnel
    - Ensure that all applicable sampling requirements and frequencies, test procedures, and Standard Operating Procedures are adhered to
    - Ensure that all reports, charts, and other documentation is completed as required
2) Provide QCT personnel at the plant as follows:
    - If daily production for all mix types is to be greater than 250 tons (megagrams), have a QCT person at the plant at all times during production and shipment of mixture until all required acceptance tests have been completed
    - If daily production for all mix types will not be greater than 250 tons (megagrams) a QCT may be responsible for conducting tests at up to two plants, subject to random number sample selection
    - Have available at the plant or within immediate contact by phone or radio a Level 2 QCT responsible for making prompt process control adjustments as necessary to correct the mix
3) Sampling, Testing, and Inspection Requirements.

    Provide all sample containers, extractants, forms, diaries, and other supplies subject to approval of the Engineer.

Perform daily sampling, testing, and inspection of mixture production that meets the following requirements:

(a) Randomly sample mixtures according to GSP 15, and GDT 73 (Method C) and test on a lot basis. In the event less than the specified number of samples are taken, obtain representative 6 in (150 mm) cores from the roadway at a location where the load not sampled was placed. Take enough cores to ensure minimum sample size requirements are met for each sample needed.

(b) Maintain a printed copy of the computer generated random sampling data as a part of the project records.

(c) Perform sampling, testing, and inspection duties of GSP 21.

(d) Perform extraction or ignition test (GDT 83 or GDT 125) and extraction analysis (GDT 38). If the ignition oven is used, a printout of sample data including weights shall become a part of the project records. For asphalt cement content only, digital printouts of liquid asphalt cement weights may be substituted in lieu of an extraction test for plants with digital recorders. Calculate the asphalt content from the ticket representing the mixture tested for gradation.

(e) Save extracted aggregate, opposite quarters, and remaining material (for possible referee testing) of each sample as follows:

- Store in properly labeled, suitable containers
- Secure in a protected environment
- Store for three working days. If not obtained by the Department, within three days they may be discarded.

(f) Maintain a process control flow chart daily for each sieve specified on the job mix formula and including the percent asphalt cement. The flow chart shall include:

- Allowable ranges based on the Mixture Control Tolerance in Section 828
- A graph plot of the deviations from the job mix formula for each test per mix type

(g) Add the following information on load tickets from which a sample or temperature check is taken:

- Mixture temperature
- Signature of the QCT person performing the testing

Note: Determine mixture temperature at least once per hour of production for OGFC and PEM mixes.

(h) Calibrate the lime system when hydrated lime is included in the mixture:

- Perform a minimum of twice weekly during production
- Post results at the plant for review

- Provide records of materials invoices upon request (including asphalt cement, aggregate, hydrated lime, etc.)

(i) Take action if acceptance test results are outside Mixture Control Tolerances of Section 828.

- One sample out of tolerance
  (1) Contact Level 2 - QCT to determine if a plant adjustment is needed
  (2) Immediately run a process control sample. Make immediate plant adjustments if this sample is also out of tolerance
  (3) Test additional process control samples as needed to ensure corrective action taken appropriately controls the mixture
- Two consecutive acceptance samples of the same mix type out of tolerance regardless of Lot or mix design level, or three consecutive acceptance samples out of tolerance regardless of mix type
  (1) Stop plant production immediately
  (2) Reject any mixture already in storage that:
    - Deviates more than 10 percent in gradation from the job mix formula based on the acceptance sample
    - Deviates more than 0.7 percent in asphalt content from the job mix formula based on the acceptance sample
  (3) Make a plant correction to any mix type out of tolerance prior to resuming production
    - Do not send any mixture to the project before test results of a process control sample meets Mixture Control Tolerances
    - Reject any mixture produced at initial restarting that does not meet Mixture Control Tolerances

4) Comparison Testing and Quality Assurance Program

Periodic comparison testing by the Department will be required of each QCT to monitor consistency of equipment and test procedures. The Department will take independent samples to monitor the Contractor's quality control program.

a) Comparison Sampling and Testing

Retain samples for comparison testing and referee testing if needed as described in Subsection 400.3.06.A.3.b.3. Discard these samples only if the Contractor's acceptance test results meet a 1.00 pay factor and the Department does not procure the samples within three working days.

The Department will test comparison samples on a random basis. Results will be compared to the respective contractor acceptance tests and the maximum difference shall be as follows:

Table 6—Allowable Percent Difference Between Department and Contractor Acceptance Tests

SIEVE SIZE	SURFACE	SUB-SURFACE
1/2 in. (12.5 mm)		4.0%
3/8 in. (9.5 mm)	3.5%	4.0%
No. 4 (4.75 mm)	3.5%	3.5%
No. 8 (2.36 mm)	2.5%	3.0%
No. 200 (75 μm)	2.0%	2.0%
A.C.	0.4%	0.5%

NOTE: Pavement courses to be overlaid with OGFC or PEM mixes ae considered surface mixes.

(1) If test comparisons are within these tolerances:

- Continue production
- Use the Contractor's tests for acceptance of the lot

(2) If test comparisons are not within these tolerances:

- Another Departmental technician will test the corresponding referee sample
- Results of the referee sample will be compared to the respective contractor and Departmental tests using the tolerance for comparison samples given above.

  (a) If referee test results are within the above tolerances when compared to the Contractor acceptance test, use the Contractor's test for acceptance of the effected lot.

  (b) If referee test results are not within the above tolerances when compared to the Contractor acceptance test, the Department will review the Contractor's quality control methods and determine if a thorough investigation is needed.

b) Quality Assurance Sampling and Testing

(1) Randomly take a minimum of two quality assurance samples from the lesser of five days or five lots of production regardless of mix type or number of projects.

(2) Compare test deviation from job mix formula to Mixture Control Tolerances in Section 828. If results are outside these tolerances, another sample from the respective mix may be taken.

NOTE: For leveling courses less than 110 lb/yd² (60 kg/m²) that have quality assurance test results outside the Mixture Control Tolerances of Section 828, use the Department's test results only and applicable pay factors will apply.

If test results of the additional sample are not within Mixture Control Tolerances, the Department will take the following action:

- Take random samples from throughout the lot as in Subsection 400.3.06.A.3.b.3 and use these test results for acceptance and in calculations for the monthly plant rating. Applicable pay factors will apply and the contractor QCT test results will not be included in pay factor calculations nor in the monthly plant rating.
- Determine if the Contractor's quality control program is satisfactory and require prompt corrective action by the Contractor if specification requirements are not being met.
- Determine if the QCT has not followed Departmental procedures or has provided erroneous information.
- Take samples of any in-place mixture represented by unacceptable QCT tests and use the additional sample results for acceptance and in calculations for the monthly plant rating and apply applicable pay factors. The Contractor QCT tests will not be included in the pay factor calculations nor in the monthly plant rating.

B. Compaction

Determine the mixture compaction using either GDT 39 or GDT 59. The compaction is accepted in lots defined in Subsection 400.3.06. A "Acceptance Plans for Gradation and Asphalt Cement Content" and is within the same lot boundaries as the mixture acceptance.

1. Calculate Pavement Mean Air Voids

   The Department will calculate the pavement air voids placed within each lot as follows:

   a. Average the results of 5 tests run on randomly selected sites in that lot.

   b. Select the random sites using GDT 73.

   Density tests are not required for asphaltic concrete placed at 90 lbs/yd^2 (50 kg/m^2) or less, 4.75 mm mix, and asphaltic concrete OGFC and PEM. Compact these courses to the Engineer's satisfaction.

   The maximum Pavement Mean Air Voids for all Superpave and Stone Matrix Asphalt mixtures shall be 7.8 percent. The adjustment period for density shall be three lots or three production days, whichever is less, in order for the contractor to ensure maximum compactive effort has been achieved which will yield no more than 7.8 percent Mean Air Voids. If the contractor needs to adjust the mixture to improve density results, a change in the job mix formula may be requested for approval during the adjustment period so long as the following values are not exceeded:

   - Coarse pay sieve ± 4%
   - No. 8 (2.36 mm) sieve ± 2%
   - No. 200 (75 μm) sieve ± 1%
   - Asphalt Content ± 0.2%

- All value changes must still be within specification limits

If the Office of Materials and Research is satisfied that the contractor has exerted the maximum compactive effort and is not able to maintain Pavement Mean Air Voids at no more than 7.8%, the Engineer may establish a maximum target for Pavement Mean Air Voids.

Mixture placed during the adjustment period for density shall meet the requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01.C, "Calculate Mean Pavement Air Voids." Mixture which does not meet these density requirements shall be paid for using the applicable pay factor.

If the mean air voids of the pavement placed within a lot exceeds 7.8% (or 100% of the maximum target air voids, if established) and the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer.

2. Obtain Uniform Compaction

For a lot to receive a pay factor of 1.00 for compaction acceptance, the air void range cannot exceed 4 percent for new construction or 5 percent for resurfacing projects. The range is the difference between the highest and lowest acceptance test results within the affected lot. If the air void range exceeds these tolerances, apply a Pay Factor of 95%.

The 5% reduced pay factor for the compaction range does not apply in these instances:

- The mixture is placed during the adjustment period as defined in Subsection 400.5.01.A, "Materials Produced and Placed During the Adjustment Period."
- All air void results within a given lot are less than 7.8%.

C. Surface Tolerance

In this Specification, pavement courses to be overlaid with a friction course are considered surface courses. Other asphalt paving is subject to straightedge and visual inspection and irregularity correction as shown below:

1. Visual and Straightedge Inspection

Paving is subject to visual and straightedge inspection during and after construction operations until Final Acceptance. Locate surface irregularities as follows:

a. Keep a 10 ft (3 m) straightedge near the paving operation to measure surface irregularities on courses. Provide the straightedge and the labor for its use.

b. Inspect the base, intermediate, and surface course surfaces with the straightedge to detect irregularities.

c. Correct irregularities that exceed 3/16 in. in 10 ft (5 mm in 3 m) for base and intermediate courses, and 1/8 in. in 10 ft (3 mm in 3 m) for surface courses.

Mixture or operating techniques will be stopped if irregularities such as rippling, tearing, or pulling occur and the Engineer suspects a continuing equipment problem. Stop the paving operation and correct the problem. Correct surface course evaluations on individual Laser Road Profiler test sections, normally 1mile (1 km) long.

2. Target Surface Smoothness

The Department will use the Laser Road Profiler method to conduct acceptance testing for surface course tolerance according to GDT 126. This testing will be performed only on:

- Surface courses
- Mainline traveled way
- Ramps more than 0.5 mile (800 m) long

Achieve the smoothest possible ride during construction. Do not exceed the target Laser Road Profiler smoothness index as shown below:

Table 7—Pavement Smoothness Requirements—New Construction

Construction Description	Smoothness Index
Asphaltic concrete OGFC and PEM on interstates and asphaltic concrete OGFC and PEM on new construction	750
Other resurfacing on interstates, asphaltic concrete OGFC and PEM resurfacing on state routes, and new construction	825
All other resurfacing on state routes (excluding LARP, PR, airports, etc.)	900

If the target values are not achieved, immediately adjust the operations to meet the target values.

Corrective work is required if the surface smoothness exceeds the Laser Road Profiler smoothness index shown below:

Table 8—Pavement Smoothness Requirements—Corrective Work

Construction Description	Smoothness Index
Asphaltic concrete OGFC and PEM on interstates and asphaltic concrete OGFC and PEM on new construction	825
Other resurfacing on interstates, asphaltic concrete OGFC and PEM resurfacing on state routes, and new construction	900
All other resurfacing on state routes (excluding LARP, PR, airports, etc.)	1025

If surface tolerance deficiencies need correction, obtain the Engineer's approval of the methods and type mix used.

3. Bridge Approach Ride Quality

The following are subject to a ride quality test by the Department for 100 ft. (30 m) of roadway approaching each end of a bridge using the Rainhart Profilograph:

- A state road with 4 lanes or more
- A 2-lane state road with a current traffic count of 2,000 vpd or more
- Locations designated on the Plans

All other bridge approaches shall meet the 1/8 in. in 10 ft (3 mm in 3 m) straightedge requirement. Test ride quality as follows:

a. The Department will determine a profile index value according to test method GDT 78.

b. The Department will average the profile index value from the right and left wheelpath for each 100 ft (30 m) section for each lane. Keep the profile index value under 30.

c. Meet the profile index value for the 100 ft (30 m) section of roadway up to the joint with the approach slab.

d. Schedule the profilograph testing 5 days before needed. Clean and clear obstructions from the test area.

e. Correct the sections that do not meet the ride quality criteria of this Specification. After correction, these sections are subject to retesting with the Rainhart Profilograph. The Engineer shall direct the type of correction method, which may include:

- Milling
- Grinding
- Removing and replacing the roadway

No additional compensation will be made.

The Department will perform Profilograph testing up to two times on the bridge approaches at no cost to the Contractor. Additional profilograph testing will cost the Contractor $500 per test.

D. Reevaluation of Lots

When lots are reevaluated as shown in Subsection 106.03, "Samples, Tests, Cited Specifications," sampling and testing is according to GDT 73. Request shall be made for reevaluation immediately upon notification of the lot results. The following procedures apply:

1. Mixture Acceptance

   The Department will take the same number of new tests on cores taken at a location where the load sampled was placed and will use only those core results for acceptance.

   The Department will use the mean of the deviations from the job mix formula for these tests to determine acceptance based on the appropriate column in the Asphalt Cement Content and Aggregate Gradation of Asphalt Concrete Mixture Acceptance Schedule—Table 9 or 10.

2. Compaction Acceptance

   The Department will reevaluate the lot through additional testing by cutting 5 cores and averaging these results with the results of the original 5 compaction tests. The Department will use the average to determine acceptance according to the Compaction Acceptance Schedule in Subsection 400.5.01.C, "Calculate Pavement Mean Air Voids".

Table 9—Mixture Acceptance Schedule—Surface Mixes

Mixture Characteristics	Pay Factor	Mean of the Deviations from the Job Mix Formula							
		1 Test	2 Tests	3 Tests	4 Tests	5 Tests	6 Tests	7 Tests	8 Tests
Asphalt Cement Content (Extraction, Ignition)	1.00	0.00 - 0.70	0.00 - 0.54	0.00 - 0.46	0.00 - 0.41	0.00 - 0.38	0.00 - 0.35	0.00 - 0.32	0.00 - 0.30
	0.95	0.71 - 0.80	0.55 - 0.61	0.47 - 0.52	0.42 - 0.46	0.39 - 0.43	0.36 - 0.39	0.33 - 0.36	0.31 - 0.34
	0.90	0.81 - 0.90	0.62 - 0.68	0.53 - 0.58	0.47 - 0.51	0.44 - 0.47	0.40 - 0.45	0.37 - 0.40	0.35 - 0.37
	0.80	0.91 - 1.00	0.69 - 0.75	0.59 - 0.64	0.52 - 0.56	0.48 - 0.52	0.44 - 0.47	0.41 - 0.44	0.38 - 0.41
	0.70	1.01 - 1.19	0.76 - 0.82	0.65 - 0.69	0.57 - 0.61	0.53 - 0.56	0.48 - 0.51	0.45 - 0.47	0.42 - 0.44
	0.50	1.20 - 1.40	0.83 - 0.85	0.70 - 0.72	0.62 - 0.64	0.57 - 0.59	0.52 - 0.55	0.48 - 0.51	0.45 - 0.48
3/8 in. (9.5 mm) Sieve (12.5 mm OGFC, 12.5 mm PEM, 12.5 mm Superpave)	1.00	0.00 - 0.9	0.00 - 6.6	0.00 - 5.6	0.00 - 5.0	0.00 - 4.6	0.00 - 4.2	0.00 - 3.9	0.00 - 3.6
	0.98	9.1 - 10.0	6.7 - 7.5	5.7 - 6.3	5.1 - 5.6	4.7 - 5.2	4.3 - 4.7	4.0 - 4.4	3.7 - 4.1
	0.95	10.1 - 11.9	7.6 - 8.4	6.4 - 7.0	5.7 - 6.3	5.3 - 5.8	4.8 - 5.3	4.5 - 5.0	4.2 - 4.6
	0.90	12.0 - 13.0	8.5 - 9.3	7.1 - 7.7	6.4 - 6.9	5.9 - 6.3	5.4 - 5.8	5.1 - 5.4	4.7 - 5.0
	0.85	13.1 - 14.0	9.4 - 10.2	7.8 - 8.6	7.0 - 7.6	6.4 - 6.9	5.9 - 6.3	5.5 - 5.9	5.1 - 5.5
	0.80	14.1 - 14.5	10.3 - 10.5	8.7 - 8.9	7.7 - 8.0	7.0 - 7.5	6.4 - 6.8	6.0 - 6.4	5.6 - 6.0
3/8 in. (9.5 mm) Sieve (12.5 mm SMA)	1.00	0.0 - 6.8	0.00 - 5.0	0.00 - 4.2	0.00 - 3.8	0.00 - 3.4	0.00 - 3.2	0.00 - 2.9	0.00 - 2.7
	0.98	6.9 - 7.5	5.1 - 5.6	4.6 - 4.7	3.9 - 4.2	3.5 - 3.9	3.3 - 3.5	3.0 - 3.3	2.8 - 3.1
	0.95	7.6 - 8.9	5.7 - 6.3	4.8 - 5.2	4.3 - 4.7	4.0 - 4.4	3.6 - 4.0	3.4 - 3.8	3.2 - 3.4
	0.90	9.0 - 9.8	6.4 - 7.0	5.3 - 5.8	4.8 - 5.2	4.5 - 4.8	4.1 - 4.4	3.9 - 4.1	3.5 - 3.8
	0.85	9.9 - 10.5	7.1 - 7.6	5.9 - 6.4	5.3 - 5.7	4.9 - 5.2	4.5 - 4.7	4.2 - 4.4	3.9 - 4.1
	0.80	10.6 - 10.9	7.7 - 7.9	6.5 - 6.7	5.8 - 6.0	5.3 - 5.6	4.8 - 5.1	4.5 - 4.8	4.2 - 4.5
No. 4 (4.75 mm) Sieve (9.5 mm OGFC, 9.5 mm Superpave)	1.00	0.00 - 9.0	0.00 - 6.7	0.00 - 5.7	0.00 - 5.2	0.00 - 4.8	0.00 - 4.4	0.00 - 4.1	0.00 - 3.8
	0.98	9.1 - 10.0	6.8 - 7.6	5.8 - 6.3	5.3 - 5.8	4.9 - 5.4	4.5 - 4.9	4.2 - 4.6	3.9 - 4.3
	0.95	10.1 - 11.9	7.7 - 8.5	6.4 - 6.9	5.9 - 6.4	5.5 - 5.9	5.0 - 5.4	4.7 - 5.0	4.4 - 4.7

Mixture Characteristics	Pay Factor	Mean of the Deviations from the Job Mix Formula							
		1 Test	2 Tests	3 Tests	4 Tests	5 Tests	6 Tests	7 Tests	8 Tests
	0.90	12.0 - 13.0	8.6 - 9.4	7.0 - 7.5	6.5 - 7.0	6.0 - 6.5	5.5 - 5.9	5.1 - 5.5	4.8 - 5.1
	0.85	13.1 - 14.0	9.5 - 10.2	7.6 - 8.0	7.1 - 7.6	6.6 - 7.0	6.0 - 6.4	5.6 - 5.9	5.2 - 5.5
	0.80	14.1 - 14.5	10.3 - 10.5	8.1 - 8.3	7.7 - 8.0	7.1 - 7.5	6.5 - 6.9	6.0 - 6.4	5.6 - 5.9
No. 4 (4.75 mm) Sieve (9.5 mm SMA)	1.00	0.00 - 6.8	0.00 - 5.0	0.00 - 4.3	0.00 - 3.9	0.00 - 3.6	0.00 - 3.3	0.00 - 3.1	0.00 - 2.8
	0.98	6.9 - 7.5	5.1 - 5.7	4.4 - 4.7	4.0 - 4.4	3.7 - 4.0	3.4 - 3.7	3.2 - 3.4	2.9 - 3.2
	0.95	7.6 - 8.9	5.8 - 6.4	4.8 - 5.2	4.5 - 4.8	4.1 - 4.4	3.8 - 4.0	3.5 - 3.8	3.3 - 3.5
	0.90	9.0 - 9.8	6.5 - 7.0	5.3 - 5.6	4.9 - 5.2	4.5 - 4.9	4.1 - 4.4	3.9 - 4.1	3.6 - 3.8
	0.85	9.9 - 10.5	7.1 - 7.7	5.7 - 6.0	5.3 - 5.7	5.0 - 5.2	4.3 - 4.8	4.2 - 4.4	3.9 - 4.1
	0.80	10.6 - 10.9	7.8 - 7.9	6.1 - 6.2	5.8 - 6.0	5.3 - 5.6	4.9 - 5.2	4.5 - 4.8	4.2 - 4.4
No. 8 (2.36 mm) Sieve (Superpave and 4.75 mm mixes)	1.00	0.00 - 7.0	0.00 - 5.6	0.00 - 4.8	0.00 - 4.3	0.00 - 4.0	0.00 - 3.6	0.00 - 3.4	0.00 - 3.2
	0.98	7.1 - 8.0	5.7 - 6.3	4.9 - 5.4	4.4 - 4.8	4.1 - 4.5	3.7 - 4.1	3.5 - 3.8	3.3 - 3.6
	0.95	8.1 - 9.0	6.4 - 7.0	5.5 - 6.0	4.9 - 5.3	4.6 - 4.9	4.2 - 4.5	3.9 - 4.2	3.7 - 3.9
	0.90	9.1 - 10.9	7.1 - 7.7	6.1 - 6.6	5.4 - 5.8	5.0 - 5.4	4.6 - 4.9	4.3 - 4.6	4.0 - 4.3
	0.85	11.0 - 12.0	7.8 - 8.5	6.7 - 7.2	5.9 - 6.4	5.5 - 5.8	5.0 - 5.3	4.7 - 5.0	4.4 - 4.6
	0.75	12.1 - 12.5	8.6 - 8.8	7.3 - 7.5	6.5 - 6.8	5.9 - 6.3	5.4 - 5.7	5.1 - 5.3	4.7 - 4.9
No. 8 (2.36 mm) Sieve (12.5 mm SMA, 9.5 mm SMA)	1.00	0.00 - 5.3	0.00 - 4.2	0.00 - 3.6	0.00 - 3.2	0.00 - 3.0	0.00 - 2.7	0.00 - 2.6	0.00 - 2.4
	0.98	5.4 - 6.0	4.3 - 4.7	3.7 - 4.0	3.3 - 3.6	3.1 - 3.4	2.8 - 3.1	2.7 - 2.9	2.5 - 2.7
	0.95	6.1 - 6.8	4.8 - 5.3	4.1 - 4.5	3.7 - 4.0	3.5 - 3.7	3.2 - 3.4	3.0 - 3.2	2.8 - 2.9
	0.90	6.9 - 8.2	5.4 - 5.8	5.6 - 5.0	4.1 - 4.5	3.8 - 4.0	3.5 - 3.7	3.3 - 3.5	3.0 - 3.2
	0.85	8.3 - 9.0	5.9 - 6.4	5.1 - 5.4	4.6 - 4.8	4.1 - 4.4	3.8 - 4.0	3.6 - 3.8	3.3 - 3.4

Mixture Characteristics	Pay Factor	Mean of the Deviations from the Job Mix Formula							
		1 Test	2 Tests	3 Tests	4 Tests	5 Tests	6 Tests	7 Tests	8 Tests
	0.75	9.1 - 9.4	6.5 - 6.6	5.5 - 5.0	4.9 - 5.1	4.5 - 4.7	4.1 - 4.3	3.9 - 4.0	3.5 - 3.7
No. 8 (2.36 mm) Sieve for OGFC and PEM mixes: When the mean of the deviations from the Job Mix Formula for a particular lot exceeds the tolerance for a 1.00 pay factor in the appropriate column, the lot will be paid for at 0.50 of the Contract Price.									

Table 10—Mixture Acceptance Schedule—Subsurface Mixes

Mixture Characteristics	Pay Factor	Mean of the Deviations from the Job Mix Formula							
		1 Test	2 Tests	3 Tests	4 Tests	5 Tests	6 Tests	7 Tests	8 Tests
Asphalt Cement Content (Extraction, Ignition)	1.00	0.00 - 0.80	0.00 - 0.61	0.00 - 0.52	0.00 - 0.46	0.00 - 0.43	0.00 - 0.39	0.00 - 0.36	0.00 - 0.34
	0.95	0.81 - 0.90	0.62 - 0.68	0.53 - 0.58	0.47 - 0.51	0.44 - 0.47	0.40 - 0.43	0.37 - 0.40	0.35 - 0.37
	0.90	0.91 - 1.00	0.69 - 0.75	0.59 - 0.64	0.52 - 0.56	0.48 - 0.52	0.44 - 0.47	0.41 - 0.44	0.38 - 0.41
	0.80	1.01 - 1.19	0.76 - 0.82	0.65 - 0.69	0.57 - 0.61	0.53 - 0.56	0.48 - 0.51	0.45 - 0.47	0.42 - 0.44
	0.70	1.20 - 1.40	0.83 - 0.85	0.70 - 0.72	0.62 - 0.64	0.57 - 0.59	0.52 - 0.55	0.48 - 0.51	0.45 - 0.48
	0.50	1.41 - 1.60	0.86 - 0.88	0.73 - 0.75	0.65 - 0.67	0.60 - 0.63	0.56 - 0.60	0.52 - 0.56	0.49 - 0.52
1/2 in. (12.5 mm) Sieve (25 mm Superpave)	1.00	0.00 - 12.9	0.00 - 8.1	0.00 - 6.9	0.00 - 6.1	0.00 - 5.5	0.00 - 5.0	0.00 - 4.7	0.00 - 4.4
	0.98	13.0 - 14.0	8.2 - 9.1	7.0 - 7.7	6.2 - 6.8	5.6 - 6.1	5.1 - 5.6	4.8 - 5.2	4.5 - 4.9
	0.95	14.1 - 15.0	9.2 - 10.1	7.8 - 8.5	6.9 - 7.5	6.2 - 6.7	5.7 - 6.1	5.3 - 5.7	5.0 - 5.4
	0.90	15.1 - 16.0	10.2 - 11.1	8.6 - 9.3	7.6 - 8.2	6.8 - 7.4	6.2 - 6.7	5.8 - 6.3	5.5 - 5.9
	0.85	16.1 - 17.0	11.2 - 11.5	9.4 - 9.6	8.3 - 8.6	7.5 - 7.8	6.8 - 7.0	6.4 - 6.5	6.0 - 6.1
	0.80	17.1 - 18.0	11.6 - 11.9	9.7 - 9.9	8.7 - 9.0	7.9 - 8.1	7.1 - 7.3	6.6 - 6.8	6.2 - 6.4
1/2 in. (12.5 mm) Sieve (19 mm SMA)	1.00	0.00 - 9.7	0.00 - 6.0	0.00 - 5.2	0.00 - 4.6	0.00 - 4.1	0.00 - 3.8	0.00 - 3.5	0.00 - 3.3
	0.98	9.8 - 10.5	6.2 - 6.8	5.3 - 5.8	4.7 - 5.1	4.2 - 4.6	3.9 - 4.2	3.6 - 3.9	3.4 - 3.7
	0.95	10.6 - 11.2	6.9 - 7.8	5.9 - 6.4	5.2 - 5.6	4.7 - 5.0	4.3 - 4.6	4.0 - 4.3	3.8 - 4.0
	0.90	11.3 - 12.0	7.9 - 8.3	6.5 - 7.0	5.7 - 6.1	5.1 - 5.6	4.7 - 5.0	4.4 - 4.7	4.1 - 4.4
	0.85	12.1 - 12.8	8.4 - 8.6	7.1 - 7.2	6.2 - 6.5	5.7 - 5.9	5.1 - 5.3	4.8 - 4.9	4.5 - 5.6
	0.80	12.9 - 13.5	8.7 - 8.9	7.3 - 7.4	6.6 - 6.8	6.0 - 6.1	5.4 - 5.5	5.0 - 5.1	4.7 - 4.8
3/8 in. (9.5 mm)	1.00	0.00 - 10.0	0.00 - 7.5	0.00 - 6.3	0.00 - 5.6	0.00 - 5.2	0.00 - 4.7	0.00 - 4.4	0.00 - 4.1

Mixture Characteristics	Pay Factor	Mean of the Deviations from the Job Mix Formula							
		1 Test	2 Tests	3 Tests	4 Tests	5 Tests	6 Tests	7 Tests	8 Tests
Sieve (19 mm Superpave, 12.5 mm Superpave)	0.98	10.1 - 11.9	7.6 - 8.4	6.4 - 7.0	5.7 - 6.3	5.3 - 5.8	4.8 - 5.3	4.5 - 5.0	4.2 - 4.6
	0.95	12.0 - 13.0	8.5 - 9.3	7.1 - 7.7	6.4 - 6.9	5.9 - 6.3	5.4 - 5.8	5.1 - 5.4	4.7 - 5.0
	0.90	13.1 - 14.0	9.4 - 10.2	7.8 - 8.6	7.0 - 7.6	6.4 - 6.9	5.9 - 6.3	5.5 - 5.9	5.1 - 5.5
	0.85	14.1 - 14.5	10.3 - 10.5	8.7 - 8.9	7.7 - 8.0	7.0 - 7.5	6.4 - 6.8	6.0 - 6.4	5.6 - 6.0
	0.80	14.6 - 15.0	10.6 - 10.8	9.0 - 9.2	8.1 - 8.4	7.6 - 7.8	6.9 - 7.3	6.5 - 6.8	6.1 - 6.5
No. 4 (4.75 mm) Sieve (9.5 mm Superpave)	1.00	0.00 - 10.0	0.00 - 7.6	0.00 - 6.3	0.00 - 5.8	0.00 - 5.4	0.00 - 4.9	0.00 - 4.6	0.00 - 4.3
	0.98	10.1 - 11.9	7.7 - 8.5	6.4 - 6.9	5.9 - 6.4	5.5 - 5.9	5.0 - 5.4	4.7 - 5.0	4.4 - 4.7
	0.95	12.0 - 13.0	8.6 - 9.4	7.0 - 7.5	6.5 - 7.0	6.0 - 6.5	5.5 - 5.9	5.1 - 5.5	4.8 - 5.1
	0.90	13.1 - 14.0	9.5 - 10.2	7.6 - 8.0	7.1 - 7.6	6.6 - 7.0	6.0 - 6.4	5.6 - 5.9	5.2 - 5.5
	0.85	14.1 - 14.5	10.3 - 10.5	8.1 - 8.3	7.7 - 8.0	7.1 - 7.5	6.5 - 6.9	6.0 - 6.4	5.6 - 5.9
	0.80	14.6 - 15.0	10.6 - 10.8	8.4 - 8.6	8.1 - 8.4	7.6 - 8.0	7.0 - 7.4	6.5 - 6.8	6.0 - 6.3
No. 8 (2.36 mm) Sieve (All mixes except SMA)	1.00	0.00 - 8.0	0.00 - 6.3	0.00 - 5.4	0.00 - 4.8	0.00 - 4.5	0.00 - 4.1	0.00 - 3.8	0.00 - 3.6
	0.98	8.1 - 9.0	6.4 - 7.0	5.5 - 6.0	4.9 - 5.3	4.6 - 4.9	4.2 - 4.5	3.9 - 4.2	3.7 - 3.9
	0.95	9.1 - 10.0	7.1 - 7.7	6.1 - 6.6	5.4 - 5.8	5.0 - 5.4	4.6 - 4.9	4.3 - 4.6	4.0 - 4.3
	0.90	10.1 - 11.9	7.8 - 8.5	6.7 - 7.2	5.9 - 6.4	5.5 - 5.8	5.0 - 5.3	4.7 - 5.0	4.4 - 4.6
	0.85	12.0 - 13.0	8.6 - 8.8	7.3 - 7.5	6.5 - 6.8	5.9 - 6.3	5.4 - 5.7	5.1 - 5.3	4.7 - 4.9
	0.75	13.1 - 14.0	8.9 - 9.1	7.6 - 7.8	6.9 - 7.2	6.4 - 6.6	5.8 - 6.1	5.4 - 5.7	5.0 - 5.3
No. 8 (2.36 mm) Sieve (19 mm SMA)	1.00	0.00 - 6.0	0.00 - 4.7	0.00 - 4.1	0.00 - 3.6	0.00 - 3.4	0.00 - 3.1	0.00 - 2.9	0.00 - 2.4
	0.98	6.1 - 6.8	4.8 - 5.2	4.2 - 4.5	3.7 - 4.0	3.5 - 3.7	3.2 - 3.4	3.0 - 3.2	2.8 - 2.9
	0.95	6.9 - 7.5	5.3 - 5.8	4.6 - 5.0	4.1 - 4.4	3.8 - 4.0	3.5 - 3.7	3.3 - 3.5	3.0 - 3.2

Mixture Characteristics	Pay Factor	Mean of the Deviations from the Job Mix Formula							
		1 Test	2 Tests	3 Tests	4 Tests	5 Tests	6 Tests	7 Tests	8 Tests
	0.90	7.6 - 8.9	5.9 - 6.4	5.1 - 5.4	4.5 - 4.8	4.1 - 4.4	3.8 - 4.0	3.6 - 3.8	3.3 - 3.5
	0.85	9.0 - 9.8	6.5 - 6.6	5.5 - 5.6	4.9 - 5.1	4.5 - 4.7	4.1 - 4.3	3.9 - 4.0	3.6 - 3.7
	0.75	9.9 - 10.5	6.7 - 6.8	5.7 - 5.9	5.2 - 5.4	4.8 - 5.0	4.4 - 4.6	4.1 - 4.3	3.8 - 4..0

E. Segregated Mixture

Prevent mixture placement that yields a segregated mat by following production, storage, loading, placing, and handling procedures. Also, make needed plant modifications and provide necessary auxiliary equipment. (See Subsection 400.1.01, "Definitions.")

If the mixture is segregated in the finished mat, the Department will take actions based on the degree of segregation. The actions are described below.

1. Unquestionably Unacceptable Segregation

   When the Engineer determines that the segregation in the finished mat is unquestionably unacceptable, follow these measures:

   a. Suspend Work and require the Contractor to take positive corrective action. The Department will evaluate the segregated areas to determine the extent of the corrective work to the in-place mat as follows:

      - Perform extraction and gradation analysis by taking 6 in (150 mm) cores from typical, visually unacceptable segregated areas.
      - Determine the corrective work according to Subsection 400.3.06.E.3.

   b. Require the Contractor to submit a written plan of measures and actions to prevent further segregation. Work will not continue until the plan is submitted to and approved by the Department.

   c. When work resumes, place a test section not to exceed 500 tons (500 Mg) of the affected mixture for the Department to evaluate. If a few loads show that corrective actions were not adequate, follow the measures above beginning with step 1.a. above. If the problem is solved, Work may continue.

2. Unacceptable Segregation Suspected

   When the Engineer observes segregation in the finished mat and suspects that it may be unacceptable, follow these measures:

   a. Allow work to continue at Contractor's risk.

   b. Require Contractor to immediately and continually adjust operation until the visually apparent segregated areas are eliminated from the finished mat. The Department will immediately investigate to determine the severity of the apparent segregation as follows:

      - Take 6 in (150 mm) cores from typical areas of suspect segregation.

- Test the cores for compliance with the mixture control tolerances in Section 828.

When these tolerances are exceeded, suspend work for corrective action as outlined in Subsection 400.3.06.E.3.

3. Corrective Work

a. Remove and replace (at the Contractor's expense) any segregated area where the gradation on the control sieves is found to vary 10 percent or more from the approved job mix formula, the asphalt cement varies 1.0% or more from the approved job mix formula, or if in-place air voids exceed 13.5% based on GDT 39. The control sieves for each mix type are shown in Subsection 400.5.01.B "Determine Lot Acceptance."

b. Subsurface mixes. For subsurface mixes, limit removal and replacement to the full lane width and no less than 10 ft. (3 m) long and as approved by the Engineer.

c. Surface Mixes. For surface mixes, ensure that removal and replacement is not less than the full width of the affected lane and no less than the length of the affected areas as determined by the engineer.

Surface tolerance requirements apply to the corrected areas for both subsurface and surface mixes.

400.3.07 Contractor Warranty and Maintenance

A. Contractor's Record

Maintain a dated, written record of the most recent plant calibration. Keep this record available for the Engineer's inspection at all times. Maintain records in the form of:

- Graphs
- Tables
- Charts
- Mechanically prepared data

400.4 Measurement

Thickness and spread rate tolerances for the various mixtures are specified in Subsection 400.4.A.2.b, Table 11, Thickness and Spread Rate Tolerance at Any Given Location. These tolerances are applied as outlined below:

A. Hot Mix Asphaltic Concrete Paid for by Weight

1. Plans Designate a Spread Rate

a. Thickness Determinations. Thickness determinations are not required when the Plans designate a spread rate per square yard (meter).

If the spread rate exceeds the upper limits outlined in the Subsection 400.4.A.2.b, Table 11, "Thickness and Spread Rate Tolerance at Any Given Location", the mix in excess will not be paid for.

If the rate of spread is less than the lower limit, correct the deficient course by overlaying the entire lot.

The mixture used for correcting deficient areas is paid for at the Contract Unit Price of the course being corrected and is subject to the Mixture Acceptance Schedule—Table 9 or 10.

b. Recalculate the Total Spread Rate. After the deficient hot mix course has been corrected, the total spread rate for that lot is recalculated, and mix in excess of the upper tolerance limit as outlined in the Subsection 400.4.A.2.b, Table 11, "Thickness and Spread Rate Tolerance at Any Given Location" is not paid for.

The quantity of material placed on irregular areas such as driveways, turnouts, intersections, feather edge section, etc., is deducted from the final spread determination for each lot.

2. Plans Designate Thickness

If the average thickness exceeds the tolerances specified in the Subsection 400.4.A.2.b, Table 11, "Thickness and Spread Rate Tolerance at Any Given Location", the Engineer shall take cores to determine the area of excess thickness. Excess quantity will not be paid for.

If the average thickness is deficient by more than the tolerances specified in the Thickness and Spread Rate Tolerance at Any Given Location table below, the Engineer shall take additional cores to determine the area of deficient thickness. Correct areas with thickness deficiencies as follows:

a. Overlay the deficient area with the same mixture type being corrected or with an approved surface mixture. The overlay shall extend for a minimum of 300 ft (90 m) for the full width of the course.

b. Ensure that the corrected surface course complies with Subsection 400.3.06.C.1, "Visual and Straightedge Inspection." The mixture required to correct a deficient area is paid for at the Contract Unit Price of the course being corrected.

The mixture is subject to the Mixture Acceptance Schedule—Table 9 or 10 . The quantity of the additional mixture shall not exceed the required calculated quantity used to increase the average thickness of the overlaid section to the maximum tolerance allowed under the following table.

Table 11—Thickness and Spread Rate Tolerance at Any Given Location

Course	Thickness Specified	Spread Rate Specified
Asphaltic concrete base course	± 0.5 in (±13 mm)	+40 lbs, -50 lbs (+20 kg, -30 kg)
Intermediate and/or wearing course	± 0.25 in (± 6 mm)	+20 lbs, -25 lbs (+10 kg, -15 kg)
Overall of any combination of 1 and 2	± 0.5 in (±13 mm)	+40 lbs, -50 lbs (+20 kg, -30 kg)

Note 1: For asphaltic concrete 9.5 mm OGFC and 12.5 mm OGFC, control the spread rate per lot within 5 lbs/yd^2 (3 kg/m^2) of the designated spread rate. For asphaltic concrete 12.5 mm PEM, control the spread rate per lot within 10 lbs/yd^2 (6 kg/m^2) of the designated spread rate.

Note 2: Thickness and spread rate tolerances are provided to allow normal variations within a given lot. Do not continuously operate at a thickness or spread rate not specified.

When the Plans specify a thickness, the Engineer may take as many cores as necessary to determine the average thickness of the intermediate or surface course. The Engineer shall take a minimum of one core per 1,000 ft (300 m) per two lanes of roadway. Thickness will be determined by average measurements of each core according to GDT 42.

If the average exceeds the tolerances specified in the Subsection 400.4.A.2.b, Table 11, "Thickness and Spread Rate Tolerance at Any Given Location", additional cores will be taken to determine the area of excess thickness and excess tonnage will not be paid for.

B. Hot Mix Asphaltic Concrete Paid for by Square Yard (Meter)

1. The thickness of the base course or the intermediate or surface course will be determined by the Department by cutting cores and the thickness will be determined by averaging the measurements of each core.
2. If any measurement is deficient in thickness more than the tolerances given in the table above, additional cores will be taken by the Department to determine the area of thickness deficiency. Correct thickness deficiency areas as follows:
   a. Overlay the deficient area with the same type mixtures being corrected or with surface mixture. Extend the overlay at least 300 ft (90 m) for the full width of the course.
   b. Ensure that the corrected surface course complies with Subsection 400.3.06.C.1, Visual and Straightedge Inspection" .
   c. The mixture is subject to the Mixture Acceptance Schedule—Table 9 or 10.
3. No extra payment is made for mixtures used for correction.
4. No extra payment is made for thickness in excess of that specified.

NOTE: Thickness tolerances are provided to allow normal variations within a given lot. Do not continuously operate at a thickness not specified.

C. Asphaltic Concrete

Hot mix asphaltic concrete, complete in place and accepted, is measured in tons (megagrams) or square yards (meters) as indicated in the Proposal. If payment is by the ton (megagram), the actual weight is determined by weighing each loaded vehicle on the required motor truck scale as the material is hauled to the roadway, or by using recorded weights if a digital recording device is used.

The weight measured includes all materials. No deductions are made for the weight of the individual ingredients. The actual weight is the pay weight except when the aggregates used have a combined bulk specific gravity greater than 2.75. In this case the pay weight is determined according to the following formula:

$$T1 = T \times \frac{\% AC + \frac{\% \text{ Aggregate} \times 2.75}{\text{combined bulk Sp. Gr.}} + \% Y}{100}$$

Where:

T1	Pay weight, tonnage (Mg)
T=	Actual weight
% AC=	Percent asphalt cement by weight of total mixture
% Aggregate =	Percent aggregate by weight of total mixture
Combined Bulk Sp. Gr.=	Calculated combined bulk specific gravity of various mineral aggregates used in the mixture
% Y=	Percent hydrated lime by weight of mineral aggregate

D. Bituminous Material

Bituminous material is not measured for separate payment.

E. Hydrated Lime

When hydrated lime is used as an anti-stripping additive, it is not measured for separate payment.

F. Field Laboratory

The field laboratory required in this Specification is not measured for separate payment.

G. Asphaltic Concrete Leveling

Payment of hot mix asphaltic concrete leveling, regardless of the type mix, is full compensation for furnishing materials, bituminous materials, and hydrated lime (when required) for patching and repair of minor defects, surface preparation, cleaning, hauling, mixing, spreading, and rolling.

Mixture for leveling courses is subject to the acceptance schedule as stated in Subsection 400.3.06.A and Subsection 400.3.06.B.

H. Asphaltic Concrete Patching

Hot mix asphaltic concrete patching, regardless of the type mix, is paid for at the Contract Unit Price per ton (Megagram), complete in place and accepted. Payment is full compensation for:

- Furnishing materials such as bituminous material and hydrated lime (when required)
- Preparing surface to be patched
- Cutting areas to be patched, trimmed, and cleaned
- Hauling, mixing, placing, and compacting the materials

400.4.01 Limits

When the asphaltic concrete is paid for by the square yard (meter) and multiple lifts are used, the number and thickness of the lifts are subject to the Engineer's approval and are used to prorate the pay factor for the affected roadway section.

400.5 Payment

When materials or construction are not within the tolerances in this Specification, the Contract Price will be adjusted according to Subsection 106.03, "Samples, Tests, Cited Specifications" and Subsection 400.3.06, "Quality Acceptance."

Hot mix asphaltic concrete of the various types are paid for at the Contract Unit Price per ton (megagram) or per square yard (meter). Payment is full compensation for furnishing and placing materials including asphalt cement, hydrated lime when required, approved additives, and for cleaning and repairing, preparing surfaces, hauling, mixing, spreading, rolling, and performing other operations to complete the Contract Item.

Payment will be made under:

Item No. 400	Asphaltic concrete type Superpave, group-blend, Including bituminous materials, Gilsonite modifier, and hydrated lime	Per ton (megagram)
Item No. 400	_____ inches asphaltic concrete, type Superpave, group-blend including bituminous materials, Gilsonite modifier and hydrated lime	Per square yard (meter)
Item No. 400	Asphaltic concrete type Stone Matrix Asphalt, group-blend, including polymer-modified bituminous materials and hydrated lime	Per ton (megagram)
Item No. 400	Asphaltic concrete type OGFC, group 2 only, including bituminous materials and hydrated lime	Per ton (megagram)
Item No. 400	Asphaltic concrete type OGFC, group 2 only, including polymer-modified bituminous materials and hydrated lime	Per ton (megagram)
Item No. 400	Asphaltic concrete type Porous European Mix, group 2 only, including polymer-modified bituminous materials and hydrated lime	Per ton (megagram)

400.5.01 Adjustments

A. Materials Produced and Placed During the Adjustment Period

An adjustment period is allowed at the start of mixing operations for each type of mix placed on the Contract except for Asphaltic Concrete OGFC or PEM. The adjustment period is provided to adjust or correct the mix and to establish the construction procedures and sequence of operations.

The adjustment period consists of the tons (megagrams) of the affected mix produced and placed on the first day of operation. If this quantity is less than 500 tons (500 Mg), the Engineer may combine the tons (megagrams) produced and placed on the first day of operation with the tons (megagrams) produced and placed on the next production day of the affected mix for the adjustment period.

The material produced and placed during the mixture adjustment period is one lot. If the mix is adjusted during this period, a new lot may be necessary, but a new adjustment period will not be permitted.

This material shall be paid for at 100 percent of the Contract Unit Price provided it meets the minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the Mixture Acceptance Schedule—Table 9 or 10 .

If the material placed during the adjustment period fails to meet the above requirements, it will be paid for using the applicable acceptance schedule. When the same type Superpave mixture is placed at different mix design levels and a different blend of materials is specified in the job mix formula, a new adjustment period shall be granted. However, when a Superpave mixture with the same blend of materials specified in the job mix formula is placed at different mix design levels or when a mixture used for leveling at a spread rate of 90 lbs/yd² (50 kg/m²) or less is also used for the surface mix at a spread rate greater than 90 lbs/yd² (50 kg/m²), an additional adjustment period will be allowed for compaction only. This material will be paid for at a 1.00 pay factor provided it:

- Meets the minimum requirements for a 1.00 pay factor in the Mixture Acceptance Schedule—Table 9 or 10 for both asphalt content and gradation.
- Meets the minimum requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01C, "Calculate Mean Pavement Air Voids.

Mixture which does not meet these requirements shall be paid for using the applicable acceptance schedule.

B. Determine Lot Acceptance

Pay factor adjustments are based on control sieves and asphalt cement content. The control sieves used in the mixture acceptance schedule for the various types of mix are indicated below:

Control Sieves Used in the Mixture Acceptance Schedule	
Asphaltic concrete 25 mm Superpave	1/2 in., No. 8 (12.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 19 mm SMA	1/2 in., No. 8 (12.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 19 mm Superpave	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 12.5 mm Superpave	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 12.5 mm SMA	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 12.5 mm PEM	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 12.5 mm OGFC	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 9.5 mm Superpave	No. 4, No. 8 (4.75 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 9.5 mm SMA	No. 4, No. 8 (4.75 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 9.5 mm OGFC	No. 4, No. 8 (4.75 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 4.75 mm Mix	No. 8 (2.36 mm) sieve and asphalt cement

For projects which do not have milling quantities established as a Pay Item, the Department will pay for 12.5 mm OGFC and PEM placed on ramps and end of project transitions under the appropriate mixture pay item, but the mix shall be subject to the same gradation and control sieve requirements as asphaltic concrete 9.5 mm OGFC. Add polymer-modified bituminous material, hydrated lime, and stabilizing fiber to this mix.

The Department will perform the following tasks:

1. Using the Mixture Acceptance Schedule—Table 9 or 10, determine the mean of the deviations from the job mix formula per test results per lot.
2. Determine this mean by averaging the actual numeric value of the individual deviations from the job mix formula; disregard whether the deviations are positive or negative amounts.
3. Use the Asphalt Cement Content and Aggregate Gradation of Asphalt Concrete Mixture Acceptance Schedule—Table 9 to determine acceptance of surface mixes and the Mixture Acceptance Schedule—Table 10 to determine acceptance of subsurface mixes.

On Contracts involving 1,000 tons (1000 Mg) or less of asphaltic concrete, the mixture is accepted for 100 percent payment of the asphaltic concrete Unit Price provided it meets the following:

1. Minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the applicable Mixture Acceptance Schedule—Table 9 or 10.
2. Minimum requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01C, "Calculate Pavement Mean Air Voids.

If the material placed on Contracts involving 1,000 tons (1000 Mg) or less of asphaltic concrete does not meet the above requirements, the material will be paid for using the applicable acceptance schedule.

C. Calculate Pavement Mean Air Voids

The Department will determine the percent of maximum air voids for each lot by dividing the pavement mean air voids by the maximum pavement mean air voids acceptable.

The Department will determine the payment for each lot by multiplying the Contract Unit Price by the adjusted pay factor shown in the following Air Voids Acceptance schedule:

Table 12 - Air Voids Acceptance Schedule

Pay Factor	Percent of Maximum Air Voids (Lot Average-5 Tests)	Percent of Maximum Air Voids (Lot Average-10 Tests) (for Reevaluations)
1.00	≤100	≤100
0.97	100.1 — 105	100.1 — 104
0.95	105.1 — 112	104.1— 109
0.90	112.1 — 124	109.1 — 118
0.80	124.1 — 149	118.1 — 136
0.70	149.1 —172	136.1 — 153
0.50	172.1 — 191	153.1 — 166

When the range tolerance is exceeded, the Department will apply a pay factor of 0.95 as described in Subsection 400.3.06.B.2.

D. Asphaltic Concrete For Temporary Detours

Hot mix asphaltic concrete placed on temporary detours that will not remain in place as part of the permanent pavement does not require hydrated lime. Hot mix used for this purpose is paid for at an adjusted Contract Price.

Where the Contract Price of the asphaltic concrete for permanent pavement is let by the ton (megagram), the Contract Price for the asphaltic concrete placed on temporary detours is adjusted by subtracting $0.75/ton ($0.85/mg) of mix used.

Where the Contract price of the mix in the permanent pavement is based on the square yard (meter), obtain the adjusted price for the same mix used on the temporary detour by subtracting $0.04/yd² ($0.05/ m²) per 1-in (25-mm) plan depth.

Further price adjustments required in Subsection 400.3.06, "Quality Acceptance," are based on the appropriate adjusted Contract Price for mix used in the temporary detour work.

E. Determine Lot Payment

Determine the lot payment as follows:

1. When one of the pay factors for a specific acceptance lot is less than 1.0, determine the payment for the lot by multiplying the Contract Unit Price by the adjusted pay factor.
2. When two or more pay factors for a specific acceptance lot are less than 1.0, determine the adjusted payment by multiplying the Contract Unit Price by the lowest pay factor.

If the mean of the deviations from the job mix formula of the tests for a sieve or asphalt cement content exceeds the tolerances established in the Mixture Acceptance Schedule—Table 9 or 10 and if the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer. If the pavement mean air voids exceed the tolerances established in the Air Voids Acceptance Schedule – Table 12, remove and replace the materials at the Contractor's expense.

If the Engineer determines that the material is not acceptable to leave in place, remove and replace the materials at the Contractor's expense.

Section 402—Hot Mix Recycled Asphaltic Concrete

402.1 General Description

This work includes producing and placing hot mix recycled asphaltic concrete that incorporates reclaimed asphalt pavement (RAP), reclaimed asphalt shingles (RAS), virgin aggregate, hydrated lime, and neat asphalt cement.

402.1.01 Definitions

General Provisions 101 through 150.

402.1.02 Related References

A. Standard Specifications

Section 400—Hot Mix Asphaltic Concrete Construction

Section 800—Coarse Aggregate

Section 828—Hot Mix Asphaltic Concrete Mixtures

B. Referenced Documents

Guidelines for RAP Stockpile Approval

402.1.03 Submittals

A. Certified Weight Tickets

Notify the Engineer before removing RAP from a stockpile that belongs to the Department. Submit to the Engineer the certified weight tickets of materials removed from the stockpile.

B. Affidavit

Submit to the laboratory an affidavit stating the sources of stockpiled materials to be used on a State project. Include the following information in the letter:

- State project number
- Location from which the material was removed
- Approximate removal dates
- Mix types removed and the estimated quantity of each type in the stockpiles
- Other available information about the stockpiled material such as percentage of local sand in the RAP

Obtain specific approval from the laboratory to use RAP or RAS stockpiles.

Adhere to Guidelines for RAP Stockpile Approval.

402.2 Materials

A. RAP Material Composition

Use RAP materials from any of the following:

- Existing roadway
- Contractor's RAP stockpile that has been approved by the Department
- Department stockpile

NOTE: The location of Department RAP material stockpiles will be given on the Plans.

Do not use RAP materials that contain alluvial gravel or local sand in any mixture placed on interstate projects except for mixtures used in shoulder construction. When used in shoulder construction, limit RAP containing local sand or alluvial gravel so that the sand or gravel contributes no more than 20% of the total aggregate portion of the mix.

1. RAP Percentage

   For non-interstate projects, limit the percentage of RAP allowed in recycled mixes so that the overall amount of alluvial gravel does not exceed 5 percent of the total mix. The percentage of alluvial gravel, local sand, and Group I material in the RAP will be determined through petrographic analysis or available records.

   RAP furnished to the Contractor but not used in the work remains the Contractor's property.

   RAP used in the recycled mixtures for mainline or ramps (if applicable) may make up from 0 to 40 percent of the mixture depending on the amount of RAP available, the production facilities, and whether the mixture meets the requirements in Section 828.

   The maximum ratio of RAP material to the recycled mixture is 40 percent for continuous mix type plants and 25 percent for batch type plants.

2. Process RAP Material

   Process RAP material to be used in the recycled mixture so that 100 percent will pass the 2 in (50 mm) sieve. Additional crushing and sizing may be required if the RAP aggregate exceeds the maximum sieve size for the mix type as shown in Section 828. Obtain representative materials from the RAP stockpile for the mix design.

B. RAS Material

RAS materials are produced as a by-product of manufacturing roofing shingles and/or discarded shingle scrap from the reroofing of buildings.

1. Limit the amount of RAS material used in the recycled mixture to no greater than 5 percent of the total mixture weight.
2. Shred the RAS material before incorporating it into the mix to ensure that 100 percent of the shredded pieces are less than 1/2 in (12.5 mm) in any dimension.
3. Remove all foreign materials such as paper, roofing nails, wood, or metal flashing.
4. Provide test results for Bulk Sample Analysis, known as Polarized Light Microscopy, if post-consumer shingles are used to certify the RAS material is free of asbestos. Test stockpiles at the rate of one test per 1000 tons (megagrams) prior to processing.

Other than as specifically stated in this Subsection, ensure that RAS material is used according to the same requirements as described for RAP material.

C. Asphaltic Concrete Removed from an Existing Roadway

Asphaltic concrete removed from an existing roadway becomes the Contractor's property unless specified otherwise on the Plans. RAP material retained by the Department is designated on the Plans, and the RAP shall be stockpiled at the location specified on the Plans.

D. Local Sand and Group I Material in RAP

Use of local sand in recycled mixes is restricted as stipulated in Section 828 for the Project. However, RAP which contains local sand may be used in surface and intermediate layers of non-interstate projects so long as the RAP percentage used does not contribute more than 5% local sand to the total aggregate portion of the mix. The amount of local sand in the RAP material shall be considered when determining the percentage of local sand in the total mix.

Where Pay Items specify that Group II only aggregate is to be used, RAP which consists primarily of Group II aggregate, but contains some Group I aggregate, shall be limited such that the Group I aggregate makes up no more than 5% of the total aggregate portion of the mix. When a Blend I mix is specified, any Group I materials in the RAP will be considered when determining the Group I portion allowed in the total mix as specified in Subsection 828.2.A.2.

E. Asphalt Cement

Using laboratory evaluations, the Department will determine the asphalt cement grade to be used in the recycled mixture. The asphalt cement shall meet the requirements of Section 820.

When the asphalt cement is blended with asphalt cement recovered from the RAP material and after tests on residue from thin film oven tests, the asphalt cement shall have a viscosity of 6,000 to 16,000 poises (600 to 1600 Pa) or as approved by the Engineer. Recover asphalt cement from the recycled mixture to verify that the specified viscosity is being met.

If the Engineer determines during construction that the selected asphalt cement grade is not performing satisfactorily, the Department may change the asphalt cement grade in the mixture, with no change in the Contract Unit Price.

F. Recycled Mixture

The recycled mixture shall be a homogenous mixture of RAP or RAS material, virgin aggregate, hydrated lime, and neat asphalt cement. Ensure that the mixture conforms to an approved mixture design outlined in Section 828.

402.2.01 Delivery, Storage, and Handling

Separate the stockpiles by Project sources and by Group I and Group II aggregate types. Erect a sign on each stockpile to identify the source(s).

If RAP material from different project sources becomes intermixed in a stockpile, only use those materials when approved by the laboratory.

The Department may reject by visual inspection stockpiles that are not clean and free of foreign materials.

402.3 Construction Requirements

402.3.01 Personnel

General Provisions 101 through 150.

402.3.02 Equipment

A. Hot Mix Plant

Use a hot mix plant for the recycling process with necessary modifications approved by the Engineer to process recycled material. Design, equip, and operate the plant so that the proportioning, heating, and mixing yields a uniform final mixture within the job mix formula tolerances.

B. Cold Feed Bin

Proportion the RAP or RAS material using a separate cold feed bin. Ensure that the material meets the size requirements in Subsection 402.2, "Materials." The ratio of the RAP or RAS to virgin aggregate shall be controlled gravimetrically.

C. Electronic Belt Weighing Devices

Use electronic belt weighing devices to monitor the flow of RAP or RAS and the flow of virgin aggregate. For batch-type plants, the RAP or RAS portion of the mix may be weighed in a weigh hopper before incorporating it into the pugmill.

D. Feeders and Conveyors

Equip plants with an interlocking system of feeders and conveyors that synchronize the RAP or RAS material flow with the virgin aggregate flow. Ensure that the electronic controls track the flow rates indicated by the belt weighing devices and develop the signal to automatically maintain the desired ratio at varying production rates. Design the RAP or RAS feeder bins, conveyor system, and auxiliary bins (if used) to prevent RAP material from segregating and sticking.

402.3.03 Preparation

General Provisions 101 through 150.

402.3.04 Fabrication

General Provisions 101 through 150.

402.3.05 Construction

Follow the requirements in Section 400 for hot mix recycled asphaltic concrete production and placement, materials, equipment, and acceptance plans except as noted or modified in this Specification.

402.3.06 Quality Acceptance

The Department may require additional quality control tests to determine the RAP stockpile consistency and the RAP aggregate quality. In this case, conduct at least three extraction/gradation tests from each individual source. Ensure that aggregate meets the quality standards in Section 800.

402.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

402.4 Measurement

Recycled asphaltic concrete mixture, complete in place and accepted, is measured in tons (megagrams). The weight is determined by recorded weights if an approved recording device is used. Or, the weight is determined by weighing each loaded vehicle on an approved motor truck scale as the material is hauled to the roadway.

402.4.01 Limits

General Provisions 101 through 150.

402.5 Payment

The work performed and the materials furnished as described in this Specification will be paid for at the Contract Unit Price per ton (megagram). Payment is full compensation for providing materials, hauling and necessary crushing, processing, placing, rolling and finishing the recycled mixture, and providing labor, tools, equipment, and incidentals necessary to complete the work, including hauling and stockpiling RAP or RAS material.

Payment will be made under:

Item No. 402	Recycled asphaltic concrete type, group-blend, including bituminous materials	Per ton (megagram)
Item No. 402	Recycled asphaltic concrete type, group-blend, including bituminous materials and hydrated lime	Per ton (megagram)
Item No. 402	Recycled asphaltic concrete type, group-blend, including polymer-modified bituminous materials and hydrated lime	Per ton (megagram)
Item No. 402	_____in (mm) recycled asphaltic concrete type, group-blend, including bituminous materials	Per square yard (meter)
Item No. 402	_____in (mm) recycled asphaltic concrete type, group-blend, including bituminous materials and hydrated lime	Per square yard (meter)
Item No. 402	_____in (mm) recycled asphaltic concrete type, group-blend, including polymer-modified bituminous materials and hydrated lime	Per square yard (meter)
Item No. 402	Recycled asphaltic concrete patching including bituminous materials	Per ton (megagram)
Item No. 402	Recycled asphaltic concrete patching including bituminous materials and hydrated lime	Per ton (megagram)

Item No. 402	Recycled asphaltic concrete leveling including bituminous materials	Per ton (megagram)
Item No. 402	Recycled asphaltic concrete leveling including bituminous materials and hydrated lime	Per ton (megagram)

402.5.01 Adjustments

General Provisions 101 through 150.

Section 432—Mill Asphaltic Concrete Pavement

432.1 General Description

This work includes milling existing asphaltic concrete pavement to restore proper grade and/or transverse slope, removing structurally unsound material, providing clearance for overlay in curb and gutter sections, or other purposes deemed necessary due to existing conditions. Perform the work according to these Specifications and Plan details.

432.1.01 Definitions

General Provisions 101 through 150.

432.1.02 Related References

A. Standard Specifications

Section 109—Measurement and Payment

B. Referenced Documents

GDT 126

432.1.03 Submittals

General Provisions 101 through 150.

432.2 Materials

432.2.01 Delivery, Storage, and Handling

When specified, stockpile the milled material at locations shown on the Plans.

1. Uniformly stockpile the materials approximately 6 – 8 ft (1.8 – 2.4 m) high.
2. Maintain the existing drainage pattern of water from the stockpile storage area.
3. Dress the reclaimed asphalt area to drain rainwater from the material.
4. Obtain the Engineer's approval of the stockpile locations and the method used to prevent milled material degradation, segregation, and reconsolidation.

432.3 Construction Requirements

432.3.01 Personnel

General Provisions 101 through 150.

432.3.02 Equipment

A. Milling Equipment

Use power-driven, self-propelled milling equipment that is the size and shape that allows traffic to pass safely through areas adjacent to the work. Also, use equipment that is:

- Designed to mill and remove a specified depth of existing asphalt paving
- Equipped with grade and slope controls operating from a stringline or ski and based on mechanical or sonic operation
- Capable of removing pavement to an accuracy of 1/8 in (3 mm)
- Furnished with a lighting system for night work, as necessary
- Provided with conveyors capable of side, rear, or front loading to transfer the milled material from the roadway to a truck

B. Dust Control

Provide power brooms, vacuum sweepers, power blowers, or other means to remove loose debris or dust. Do not allow dust control to restrict visibility of passing traffic or to disrupt adjacent property owners.

432.3.03 Preparation

General Provisions 101 through 150.

432.3.04 Fabrication

General Provisions 101 through 150.

432.3.05 Construction

A. Milling Operation

Follow the Plans to mill the designated areas and depths including bridge decks, shoulders, and ramps, as required. Ensure the following requirements are met:

1. Schedule the construction operation. Use milling methods that will produce a uniform finished surface and maintain a constant cross slope between extremities in each lane.
2. Provide positive drainage to prevent water accumulation on the milled pavement, as shown on the Plans or directed by the Engineer.
3. Bevel back the longitudinal vertical edges greater than 2 in (50 mm) that are produced by the removal process and left exposed to traffic. Bevel them back at least 3 in for each 2 in (75 mm for each 50 mm) of material removed. Use an attached mold board or other approved method.
4. When removing material at ramp areas and ends of milled sections, taper the transverse edges 10 ft (3 m) to avoid creating a traffic hazard and to produce a smooth surface.
5. Protect with a temporary asphaltic concrete tie-in (paper joint) vertical edges at other areas such as bridge approach slabs, drainage structures, and utility apputenance greater than 1/2 in that are left open to transversing vehicles. Place the temporary tie-in at taper rate of at least 6 to 1 horizontal to vertical distance.
6. Remove dust, residue, and loose milled material from the milled surface. Do not allow traffic on the milled surface and do not place asphaltic concrete on the milled surface until removal is complete.

The reclaimed asphaltic pavement becomes the Contractor's property unless otherwise specified.

432.3.06 Quality Acceptance

Ensure that the milling operation produces a uniform pavement texture that is true to line, grade, and cross section.

Milled pavement surface acceptance testing will be performed using the Laser Road Profiler method in GDT 126. Milled pavement will be evaluated on individual test sections, normally 1 mile (1 km) long.

When the milled surface is to be left as the final wearing surface, ensure that indices do not exceed:

- 1025 on milled pavement surfaces on interstates when the milled surface will be the final wearing surface
- 1175 for other on-system routes when the milled surface will be the final wearing surface
- 1175 on Interstates and 1325 for other on-system routes if the milled surface will be overlaid

Remill mile (kilometer) areas to meet the specified limits when the indices are exceeded. Remill at no additional cost to the Department.

Milled pavement surfaces are subject to visual and straightedge inspection. Keep a 10 ft (3 m) straightedge near the milling operation to measure surface irregularities of the milled pavement surface. Remill irregularities greater than 1/8 in per 10 ft (3 mm in 3 m) at no additional cost to the Department.

Ensure that the cross slope is uniform and that no depressions or slope misalignments greater than 1/4 in per 12 ft (6 mm in 3.6 m) exist when the slope is tested with a straightedge placed perpendicular to the center line.

432.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

432.4 Measurement

Milling existing asphaltic concrete pavement is measured by the square yard (meter) as described in Subsection 109.01, "Measurement and Quantities."

432.4.01 Limits

General Provisions 101 through 150.

432.5 Payment

Milling asphaltic concrete pavement, measured as specified, will be paid for at the Contract Unit Price bid per square yard (meter). The price bid for this item includes the credit value of all Reclaimed Asphalt Pavement (RAP) recovered, and no adjustment in the unit price for this item or other items will be considered for variations in the amount of RAP actually recovered.

Payment is full compensation for furnishing equipment, milling, hauling, stockpiling milled material, and satisfactorily performing the work.

Payment will be made under:

Item No. 432	Mill asphaltic concrete pavement, ___ in (mm) depth	Per square yard (meter)

432.5.01 Adjustments

General Provisions 101 through 150.

Section 611—Relaying, Reconstructing, or Adjusting to Grade of Miscellaneous Roadway Structures

611.1 General Description

This work includes relaying, reconstructing, resetting, adjusting to grade, capping minor structures, resetting guard rail, or adjusting other miscellaneous roadway structures as specified in the Proposal or on the Plans.

611.1.01 Definitions

General Provisions 101 through 150.

611.1.02 Related References

A. Standard Specifications

Section 610—Removal of Miscellaneous Roadway Items

Section 641—Guard Rail

Section 668—Miscellaneous Drainage Structures

Section 854—Castings and Forgings

B. Referenced Documents

General Provisions 101 through 150.

611.1.03 Submittals

General Provisions 101 through 150.

611.2 Materials

Most materials for the work in this Specification are salvaged from the removal of existing structures. The Engineer will determine the suitability of the salvaged material for use.

Use other materials to complete the structure, such as mortar, sand-cement grout, sand for sand cushion, bituminous filler, brick, and other materials that meet the requirements of the applicable Specifications for such materials for use in new structures of the same character and type.

611.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

611.3 Construction Requirements

611.3.01 Personnel

General Provisions 101 through 150.

611.3.02 Equipment

General Provisions 101 through 150.

611.3.03 Preparation

General Provisions 101 through 150.

611.3.04 Fabrication

General Provisions 101 through 150.

611.3.05 Construction

A. Miscellaneous Roadway Items

Follow these procedures to construct miscellaneous roadway items:

1. Remove existing structures to be rebuilt according to Section 610.
2. Clean the material salvaged for use in the rebuilt structure and stockpile it in convenient places. Protect it from damage until it is used.
3. Dispose of the portions of structures not suitable for reuse as provided in Section 610. Replace them with suitable new material.
4. Relay or rebuild the structures according to the Specifications for new structures of the same type.
5. Adjust to the required grade miscellaneous structures specified in the Proposal or on the Plans by raising or lowering the upper portion of the fixture, including sleeve extensions, adjustable manhole rings, gaskets, mastic, mortar, masonry, and other material.
6. Furnish materials such as mortar, sand-cement grout, sand cushion, bituminous filler, brick, castings, and other materials to excavate, trench, prepare earth foundation, backfill, and other work necessary to complete the Item.

B. Capping an Existing Structure

When capping an existing structure requires removing adjacent existing pavement, sidewalk, curb, gutter, or other improvement not otherwise affected by the work, follow these guidelines:

1. Remove the improvements to expose only the portion of the structure to be modified.
2. Replace the removed improvements to the Engineer's satisfaction without additional compensation.
3. Remove enough existing masonry to lower the top elevation to a point not less than the thickness of the cap plus 3 ft (1 m) below subgrade elevation, unless otherwise indicated.
4. Cap the remaining portion of the structure with a fitted reinforced concrete cover constructed to the general details shown on the Plans.

   Grates, rings, plates, covers, hoods, or other castings or fittings removed while capping and not re-used become the property of the Department unless otherwise indicated on the Plans.

C. Resetting Guard Rail

When resetting the guard rail is specified in the Proposal:

1. Reset guard rail removed according to Section 610 where the Plan indicates and to the required post spacing.
2. Furnish materials, including additional hardware, offset blocks, and posts.
3. Replace posts that do not conform to the Plans.
4. Follow the applicable provisions of Section 641.

D. Raising Manholes

When raising manholes:

1. Adjustments may be made by using adjustable extension rings that do not require removing the existing manhole frame.
2. Ensure that the extension device locks to the existing frame and permits height and diameter adjustment. The adjustable extension ring to be used shall have the Engineer's prior approval.
3. Choose an extension ring compatible with the existing casting and cover. Ensure that the adjustment range conforms to the finished pavement surface.
   a. Use an adjustable extension ring made of materials that meet the requirements of Subsection 854.2.01 or are manufactured from ASTM A 36/A 36M steel and approved by the Office of Materials and Research.

b. Ensure that the extension ring and cover are machine ground to reduce contact irregularity. Ensure that the grates are rattleproof.

c. Obtain the Engineer's approval for the type of adjustable extension ring used.

E. Replacing Fences

Replace fences removed under Section 610 in kind, using the removed materials as far as possible. Unless the Plans provide for new fence at the particular location, include new materials required in the Bid Price for resetting fence.

611.3.06 Quality Acceptance

General Provisions 101 through 150.

611.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

611.4 Measurement

Relaying, reconstructing, or adjusting to grade, capping minor structures, resetting guard rail, or adjusting other miscellaneous roadway structures is measured to determine the unit or units of each type completed and accepted.

Manhole tops to be raised or lowered 2 ft (600 mm) or less are considered "Adjust to Grade."

Manhole tops to be raised between 2 ft (600 mm) and 6 ft (1.8 m), or tops to be lowered more than 2 ft (600 mm), are considered "Reconstruct Manhole" and are paid as shown in Subsection 611.5, "Payment."

Remove manholes to be raised more than 6 ft (1.8 m) as clearing and grubbing, and construct a new manhole in its place according to Section 668.

611.4.01 Limits

General Provisions 101 through 150.

611.5 Payment

Relaying, reconstructing, resetting, adjusting to grade, capping minor structures, resetting guard rail, or adjusting other miscellaneous roadway structures will be paid for at the Contract Unit price. Payment is full compensation for relaying, resetting, reconstructing, or adjusting to grade the structures as specified in this Specification.

Excavation and backfill necessary for capping is considered incidental to the Item and is not paid for separately.

Tapping a new pipeline into an existing structure is not considered reconstruction of the existing structure.

Payment will be made under:

Item No. 611	Relay	Per unit shown in Proposal
Item No. 611	Reconstruct	Per unit shown in Proposal
Item No. 611	Reset	Per unit shown in Proposal
Item No. 611	Adjust to grade	Per unit shown in Proposal
Item No. 611	Cap minor structures	Per unit shown in Proposal

611.5.01 Adjustments

General Provisions 101 through 150.

Section 653—Thermoplastic Traffic Stripe

653.1 General Description

This work includes furnishing and applying thermoplastic reflectorized pavement marking compound. Ensure that markings conform to Plan details and locations, these Specifications, and the Manual on Uniform Traffic Control Devices.

Thermoplastic traffic stripe consists of solid or broken (skip) lines, words, and symbols according to Plan color, type, and location.

653.1.01 Definitions

Thermoplastic Marking Compound: A compound extruded or mechanically sprayed on the pavement that cools to pavement temperature. When combined with glass spheres it produces a reflectorized pavement marking.

Short Lines: Crosswalks, stop bars, arrows, symbols, and crosshatching. Extrude short lines rather than spraying them on. Unless otherwise specified, spray all other lines.

653.1.02 Related References

A. Standard Specifications

Section 652—Painting Traffic Stripe

B. Referenced Documents

QPL 46

Federal Test Method Standard 141, Method 4252

ASTM D 1155

ASTM D 620

ASTM D 570

ASTM D 256

ASTM D 2240

ASTM E 28

ASTM 121

653.1.03 Submittals

Ensure that the producers of the thermoplastic compound and glass spheres furnish to the Department copies of certified test reports showing results of all tests specified in this Section. Also ensure that producers certify that the materials meet the other requirements of this Section by submitting copies of certification at the time of sampling. Final Acceptance, however, will be based on satisfactory test results from samples obtained by the Department before delivery.

653.2 Materials

A. General Characteristics of Thermoplastic

1. Deterioration

   Use thermoplastic material with the following characteristics:

   a. Does not deteriorate upon contact with:

      - Pavement materials
      - Petroleum droppings from traffic
      - Chemicals, such as sodium chloride or calcium chloride, used to prevent formation of ice on roadways or streets

   b. Does not scorch, discolor, or deteriorate if kept at the manufacturer's recommended application temperature, or at least 375 °F (190 °C), for up to 4 hours.

   c. Has a temperature versus viscosity characteristic that remains constant from batch to batch through four re-heatings.

2. Fumes

   Use material that in the plastic state does not give off fumes that are toxic or harmful to persons or property.

B. Detailed Characteristics of Thermoplastic

1. Material Composition

   Use material binder with the following characteristics:

   - A mixture of synthetic resins, with at least one resin that is solid at room temperature, and high boiling point plasticizers
   - A total binder content of 18 percent to 35 percent by weight
   - A pigmented binder that is well-dispersed and free of dirt, foreign objects, or ingredients that cause bleeding, staining, or discoloration

   The binder shall be Type A—alkyd. Ensure that at least 33% of the binder composition or at least 8% by weight of the entire material formulation is a maleic-modified glycerol ester of resin. Ensure that the finished thermoplastic pavement marking material is not adversely altered by contact with oily pavement materials or by contact from oil dropping onto the pavement surface from traffic.

   Ensure that the filler has the following characteristics:

   - White calcium carbonate or equivalent
   - Compressive strength of 5,000 psi (34.5 MPa)

2. Suitability for Markings

   Use thermoplastic material that is especially compounded for traffic markings and has the following characteristics:

   - Prevents markings from smearing or spreading under normal traffic conditions at temperatures below 120 °F (49 °C)
   - Gives a uniform cross section, with pigment evenly dispersed throughout the material
   - Has a uniform material density and character throughout its thickness
   - Allows the stripe to maintain its original dimensions and placement
   - Ensures that the exposed surface is free from tack and is not slippery when wet
   - Does not lift from the pavement in freezing weather
   - Has cold ductility properties that permit normal movement with the road surface without chipping or cracking

3. Drying Time

   When applied at a temperature range of 400 °F to 425 °F (204 °C – 218 °C) and a thickness of 1/8 in. to 3/16 in. (3 mm to 5 mm), the material shall set to bear traffic in a maximum of 2 minutes when the air temperature is 50 °F ± 3 °F (10 °C ± 2 °C) and shall set to bear traffic in a maximum of 10 minutes when the air temperature is 90 °F ± 3 °F (32 °C ± 2 °C).

4. Reflectorization

   Ensure that during manufacturing, reflectorizing glass spheres were mixed into the compound to the following specifications:

   - At least 16 percent by weight using glass spheres with a minimum refractive index of 1.65
   - At least 25 percent by weight using glass spheres with a minimum refractive index of 1.50

C. Physical Requirements of Thermoplastic

1. Color

   Confirm the color of thermoplastic as follows:

   a. White thermoplastic material contains at least 8 percent by weight titanium dioxide that meets the requirements of ASTM D 476, Type II, Rutile. The white thermoplastic material shall be pure white and free from dirt or tint.

      The material, when compared to the magnesium oxide standard using a standard color spectrophotometer according to ASTM D 4960, shall meet the following:

Scale	Definition	Magnesium Oxide Standard	Sample
Rd	Reflectance	100	75 min.

a	Redness-Greenness	0	-5 to + 5
b	Yellowness-Blueness	0	-10 to + 10

Compare yellow material to match Federal Test Standard Number 595, Color 13538.

2. Color Retention

   Use thermoplastic stripe tested for color retention as follows:

   a. Test specimens prepared from samples submitted according to ASTM D 620 by the Department Inspector.
   b. Use an ultraviolet light source as specified in the test procedure, or use a 275 watt sunlamp with a built-in reflector.
   c. Ensure that after 100 hours of exposure to the light source, the test specimens show no color change when compared to an unexposed specimen.

3. Water Absorption

   Ensure that materials have no more than 0.5 percent by weight of retained water when tested by ASTM D 570, procedure (a).

4. Softening Point

   Ensure that materials have a softening point of at least 175 °F (79 °C) as determined by ASTM E 28.

5. Specific Gravity

   Ensure that the specific gravity of the thermoplastic compound at 77 °F (25 °C) is between 1.9 to 2.5.

6. Impact Resistance

   Use material with an impact resistance of at least 10 in-lbs at 77 °F (1.13 N·m at 25 °C), tested as follows:

   a. Heat for 4 hours at 400 °F (204 °C).
   b. Cast into bars of 1 in² (625 mm²) cross sectional area, 3 in (75 mm) long.
   c. Place with 1 in (25 mm) extending above the vise in a cantilever beam (Izod type) tester using the 25 in-lbs (2.82 N·m) scale. This instrument is described in ASTM D 256.

7. Indentation Resistance

   Measure the hardness by a Shore Durometer, Type A2, as described in ASTM D 2240. Maintain the temperature of the Durometer, 4.4 lb. (2 kg) load and the specimen at 115 °F (45 °C). Apply the Durometer and 4.4 lb. (2 kg) load to the specimen and the reading shall be between 50 to 75 units, after 15 seconds.

8. Low Temperature Stress Resistance

   a. Furnish sample test blocks as follows:
      1) Coat the samples using the same method as the planned installation of the compound.
      2) Coat the samples with at least 32 in² (206 mm^2) of the compound.
   b. Have the samples tested as follows:
      1) Immerse a sample in cold water for one hour.
      2) Immediately place the sample in a freezer chest or other insulated cold compartment and maintain at a temperature of –20 °F (–29 °C) for 24 hours.
      3) After 24 hours, remove the sample and bring it to normal room temperature.

      Following the test, confirm that the sample does not crack, flake, or fail to adhere to the substrate.

9. Reheating

   Ensure that the compound does not break down, deteriorate, scorch, or discolor if held for 6 hours at the plastic temperature of 425 °F (218 °C); or if reheated up to the plastic temperature 4 times.

10. Abrasion Resistance

    Have the material tested for abrasion resistance as follows:

    a. Ensure that the maximum loss of the material does not exceed 0.4 grams when subjected to 200 revolutions on a Taber Abraser at 77 °F (25 °C), using H-22 Calibrade wheels that are weighted to 500 grams.
    b. Keep the wearing surface wet with distilled water throughout the test.

c. Prepare the panel by forming a representative lot of material at a thickness of 0.125 in. (3.18 mm) on a 4 in (100 mm) square steel plate with a thickness of 0.050 ± 0.001 in (1.27 mm ± 0.03 mm), on which a primer has been previously applied.

11. Yellowness Index

The white thermoplastic material shall not exceed a yellowness index of 0.12 according to AASHTO T 250.

12. Flowability

After heating the thermoplastic material for 240 ± 5 minutes at 425 °F ± 3 °F (218 °C ± 2 °C) and testing the flowability, ensure that the white thermoplastic has a maximum of 21 percent residue according to AASHTO T 250.

13. Flowability-Extended Heating

After heating the thermoplastic material for 8.0 ± 0.5 hours at 425 °F ± 3 °F (218 °C ± 2 °C), while stirring the last 6 hours and testing for flowability, ensure that the thermoplastic has a maximum percent residue of 28 according to AASHTO T 250.

14. Storage Life

The material shall meet the requirements of this specification for 1 year. Ensure that the thermoplastic melts uniformly with no evidence of skins or unmelted particles during the 1-year period.

D. Physical Requirements of Glass Spheres

1. Premixed Glass Spheres

Ensure that the compound has been manufactured with glass spheres in the proportion specified in Subsection 653.2.B.4, "Reflectorization." The glass spheres contained in the material shall meet the following requirements:

a. Index of Refraction**.** Determine the index of refraction of the premixed glass spheres by the liquid immersion method at 77 °F (25 °C).

b. Roundness**.** Ensure that the minimum percentages of premixed glass spheres are true spheres according to the following table:

Percent of Premixed Glass Spheres That are True Spheres (when tested according to ASTM D 1155)		
Minimum Index of Refraction	**Percent of Overall Beads**	**Percent of Beads Retained on any Sieve**
1.65	At least 75%	At least 70%
1.50	At least 70%	At least 60%

c. Imperfections**.** Ensure that no more than 5 percent of the spheres show air inclusions, bubbles, lap lines, chill wrinkles, or other imperfections when viewed through a 60-power microscope in the refractive index liquid.

d. Foreign Matter**.** Ensure that the quantity of foreign matter does not exceed 1 percent.

e. Gradation**.** Have the beads tested using ASTM: D 1214 to ensure they have the following gradations:

U.S. Sieve Standard Sieve Size	Percent Passing
No. 16 (1.18 mm)	100
No. 30 (600 µm*)	60 to 90
No. 50 (300 µm)	15 to 40
No. 80 (180 µm)	0 to 10
No. 100 (150 µm)	0 to 5
*µ = micro meter	

f. Chemical Resistance. Use material manufactured with glass spheres that withstand immersion in water and acids without corroding or etching, and withstand sulfides without darkening or decomposing.

Have the chemical resistance tested by placing a 3 g to 5 g sample in each of three glass beakers or porcelain dishes and immersing as follows:

- Cover the first with distilled water.

- Cover the second with a 3N solution of sulfuric acid.
- Cover the third with a solution of 50 percent sodium sulfide, 48 percent distilled water, and 2 percent Aerosol 1B or similar wetting agent.

Ensure that after one hour no darkening, hazing, or other evidence of instability is evident when examined microscopically.

2. Drop-On Glass Spheres

   Ensure that these spheres meet the requirements of Subsection 652.2.

E. Requirements of Sealing Primer

Place the particular type of two-part epoxy binder-sealer at the application rate as recommended in writing by the thermoplastic material manufacturer.

653.2.01 Delivery, Storage, and Handling

Use material delivered in 50 lb (22.7 kg) unit cardboard containers or bags strong enough for normal handling during shipment and on-the-job transportation without loss of material.

Ensure that each unit container is clearly marked to indicate the following:

- Color of the material
- Process batch number or similar manufacturer's identification
- Manufacturer's name
- Address of the plant
- Date of manufacture

653.3 Construction Requirements

653.3.01 Personnel

General Provisions 101 through 150.

653.3.02 Equipment

Depending on the marking required, use hand equipment or truck-mounted application units on roadway installations.

A. Spray Application Machine

Ensure that each spray application machine is equipped with the following features:

- Parts continuously mix and agitate the material.
- Truck-mounted units for lane, edge, and center lines can operate at a minimum of 5 mph (8 kph) while installing striping.
- Conveying parts between the main material reservoir and the shaping die or gun prevent accumulation and clogging.
- Parts that contact the material are easily accessible and exposable for cleaning and maintenance.
- Mixing and conveying parts, including the shaping die or gun, maintain the material at the plastic temperature with heat transfer oil or electrical element controlled heat. Do not use an external source of direct heat.
- Parts provide continuously uniform stripe dimensions.
- Applicator cleanly and squarely cuts off stripe ends and applies skip lines. Do not use pans, aprons, or similar appliances that the die overruns.
- Parts produce varying widths of traffic markings.
- Applicator is mobile and maneuverable enough to follow straight lines and make normal curves in a true arc.

B. Automatic Bead Dispenser

Apply glass spheres to the surface of the completed stripe using a dispenser attached to the striping machine to automatically dispense the beads instantaneously upon the installed line. Synchronize the glass sphere dispenser cutoff with the automatic cutoff of the thermoplastic material.

C. Special Kettles

Use special kettles for melting and heating the thermoplastic material. Kettles equipped with automatic thermostatic control devices provide positive temperature control and prevent overheating. Ensure that the applicator and kettles are equipped and arranged according to the requirements of the National Fire Underwriters.

D. Hand Equipment

Use hand equipment for projects with small quantities of lane lines, edge lines, and center lines, or for conditions that require the equipment. Use hand equipment approved by the Engineer.

Ensure that hand equipment can hold 150 lbs (68 kg) of molten material and is maneuverable to install crosswalks, arrows, legends, lane, edge, and center lines.

E. Auxiliary Vehicles

Supply the necessary auxiliary vehicles for the operation.

653.3.03 Preparation

General Provisions 101 through 150.

653.3.04 Fabrication

General Provisions 101 through 150.

653.3.05 Construction

A. General Application

Thoroughly clean pavement areas to be striped. Use hand brooms, rotary brooms, air blasts, scrapers, or other approved methods that leave the pavement surface clean and undamaged. Take care to remove all vegetation and road film from the striping area. All new Portland Cement Concrete pavement surfaces shall be mechanically wire brushed or abrasive cleaned to remove all laitance and curing compound before being striped.

Lay stripe with continuous uniform dimensions.

Apply the type of stripe at each location according to the Plans, using one of the following methods:

- Spray techniques
- Extrusion methods wherein one side of the shaping die is the pavement, and the other three sides are contained by or are part of the suitable equipment to heat and control the flow of material.

1. Temperature

   Apply thermoplastic traffic stripe only when the pavement temperature in the shade is above 40 °F (4 °C).

   To ensure optimum adhesion, install the thermoplastic material in a melted state at the manufacturer's recommended temperature but not at less than 375 °F (190 °C).

2. Moisture

   Do not apply when the surface is moist. When directed by the Engineer, perform a moisture test on the Portland cement concrete pavement surface. Perform the test as follows:

   a. Place approximately 1 yd^2 ($1m^2$) of roofing felt on the pavement surface.
   b. Pour approximately 1/2 gallon (2 L)of molten thermoplastic onto the roofing felt.
   c. After 2 minutes, lift the roofing felt and inspect to see if moisture is present on the pavement surface or underside of the roofing felt.
   d. If moisture is present, do not proceed with the striping operation until the surface has dried sufficiently to be moisture free.

3. Binder-Sealer

   To ensure optimum adhesion, apply a binder-sealer material before installing the thermoplastic in each of the following cases:

   - Extruded thermoplastic
   - Where directed by the Engineer for sprayed thermoplastic
   - Old asphaltic concrete pavements with exposed aggregates

- Portland cement concrete pavements as directed by the Engineer

Ensure that the binder-sealer material forms a continuous film that mechanically adheres to the pavement and dries rapidly. Use a binder-sealer currently in use and recommended by the thermoplastic material manufacturer according to QPL 46.

To ensure optimum adhesion, apply a two-part epoxy binder-sealer on all Portland cement concrete pavements for either sprayed or extruded thermoplastic material.

Apply the epoxy binder-sealer immediately in advance of, but concurrent with, the application of the thermoplastic material. Apply in a continuous film over the pavement surface.

4. Bonding to Old Stripe

   The old stripe may be renewed by overlaying with new material. Ensure the new material bonds to the old line without splitting or cracking.

5. Offset from Construction Joints

   Off-set longitudinal lines at least 2 in (50 mm) from construction joints of Portland cement concrete pavements.

6. Crosswalks, Stop Bars, and Symbols

   Make crosswalks, stop bars, and symbols at least 3/32 in (2.4 mm) thick at the edges and no more than 3/16 in (4.8 mm) thick at the center.

7. Film Thickness

   a. Maintain the following minimum average film thicknesses on all open graded asphalt concrete friction courses:

      - 0.120 in (3.0 mm)* for lane lines
      - 0.090 in (2.3 mm)* for edge lines
      - 0.150 in (3.8 mm)* for gore area lines

   b. Maintain the following minimum average film thicknesses on all other pavement types:

      - 0.090 in (2.3 mm)* for lane lines
      - 0.060 in (1.5 mm)* for edge lines
      - 0.120 in (3.0 mm)* for gore area lines

   (See below for '*' reference.)

   Compute the minimums by the amount of material used each day, as follows:

(For 5 in wide stripe)	
* Average Film Thickness (in) =	[(lbs used) ÷ (total linear feet)] x 0.236
(For 125 mm wide stripe)	
*Average Film Thickness (mm) =	[(kg used) ÷ (total linear meters)] x 4.0
(For 10 in wide stripe)	
* Average Film Thickness (in) =	[(lbs used) ÷ (total linear feet)] x 0.118
(For 250 mm wide stripe)	
* Average Film Thickness (mm) =	[(kg used) ÷ (total linear meters)] x 2.0

8. Glass Spheres

   a. Apply glass spheres to installed stripe surface at a minimum rate of 14 lbs of spheres to each 100 square feet ((700 g/m^2) of thermoplastic material.

   b. Apply the glass sphere top-coating with a pressure-type gun specifically designed for applying glass spheres that will embed at least one-half of the sphere's diameter into the thermoplastic immediately after the material has been applied to the pavement.

B. Removing Existing Stripe

Remove existing stripe according to Section 656.

Remove 100 percent of existing traffic stripe from:

- Portland cement concrete pavement where the new stripe will be placed at the same location as the existing marking
- Pavement where the new stripe will be placed at a different location from the existing markings

C. Tolerance and Appearance

No traffic stripe shall be less than the specified width and shall not exceed the specified width by more than 1/2 in (13mm). The length of the 10 ft (3 m) segment for skip stripe and the 30 ft (9 m) gap between segments may vary plus or minus 1 ft (300 mm). The alignment of the stripe shall not deviate from the intended alignment by more than 1 in (25 mm) on tangents and on curves up to and including 1 degree (radius of 1745 m or greater). On curves exceeding 1 degree (radius less than 1745 m), the alignment of the stripe shall not deviate from the intended alignment by more than 2 in (50 mm).

Stop work when deviation exceeds the above dimensions, and remove the nonconforming stripe.

653.3.06 Quality Acceptance

Segments of the thermoplastic traffic stripe that have been placed according to the Plans and Specifications may be accepted 30 days after the required work is complete in that segment.

If thermoplastic traffic stripe fails to meet Plan details or Specifications or deviates from stated dimensions, correct it at no additional cost to the Department. If removal of pavement markings is necessary, perform it according to Section 656 and place it according to this Specification. No additional payment will be made for removal and replacement of unsatisfactory striping.

653.3.07 Contractor Warranty and Maintenance

After segments are accepted, the Contractor will be relieved of maintenance on those segments.

653.4 Measurement

When stripe will be paid for by the square yard (meter), the actual number of square yards (meters) painted will be measured. The space between the stripes will be included in the overall measurement.

Linear measurements may be made by electronic measuring devices attached to a vehicle.

Thermoplastic traffic stripe, complete in place and accepted, is measured as follows:

A. Solid Traffic Stripe

Stripe is measured by the linear foot (meter), linear mile (kilometer), or square yard (meter). Breaks or omissions in solid lines or stripes at street or road intersections are not measured for payment.

B. Skip Traffic Stripe

Skip stripe is measured by the gross linear mile (kilometer) as specified. The unpainted space between the painted stripes is included in the overall measurement if the Plan ratio of one to three (10 ft [3 m] segment and 30 ft [9 m] gap or other patterns as designated on the Plans) remains uninterrupted. Measurement begins and ends on a stripe.

C. Words and Symbols

Each word or symbol complete according to Plan dimensions is measured by the Unit.

653.4.01 Limits

General Provisions 101 through 150.

653.5 Payment

Payment is full compensation for the Work under this section, including:

- Cleaning and preparing surfaces
- Furnishing all materials
- Applying, curing, and protecting stripe
- Protecting traffic, including providing necessary warning signs
- Furnishing tools, machines, and other equipment necessary to complete the Item

Measurement and payment for removing pavement markings will be according to Section 656 when shown in the Proposal as a payment Item. Otherwise, removal will not be paid for separately, but will be included in the payment for other Work under this section.

Payment will be made under:

Item No. 653	Thermoplastic solid traffic stripe, __ in (mm), (color)	Per linear foot (meter)
Item No. 653	Thermoplastic solid traffic stripe, __ in (mm), (color)	Per linear mile (kilometer)
Item No. 653	Thermoplastic skip traffic stripe, __ in (mm), (color)	Per gross linear foot (meter)
Item No. 653	Thermoplastic skip traffic stripe, __ in (mm), (color)	Per gross linear mile (kilometer)
Item No. 653	Thermoplastic pavement markings, words, and symbols (color), type _____	Per each
Item No. 653	Thermoplastic traffic stripe	Per square yard (meter)

653.5.01 Adjustments

General Provisions 101 through 150.

Section 800—Coarse Aggregate

800.1 General Description

This section includes requirements for coarse aggregate. All aggregate shall be the specified type, class, and grade, and shall meet the requirements for the intended use.

800.1.01 Related References

A. Standard Specifications

Section 424—Bituminous Surface Treatment

B. Referenced Documents

AASHTO	ASTM	
T 11	C 277	C 295
T 27	C 289	C 586
T 96	C 294	E 30
T 104		G 23

GDT 104

GDT 129

GDT 133

QPL 2

800.2 Materials

800.2.01 Coarse Aggregate

A. Requirements

The Contractor shall use the type, group, class, and grade of coarse aggregate specified. For coarse aggregate sources, see QPL 2.

1. Coarse Aggregate Types

Type	Characteristics
Crushed stone	Sound, durable rock particles.
Gravel	Sound, durable rock without damaging coatings.
Air-cooled blast furnace slag	Sound, durable particles with uniform density and quality, or other slags that have a good service record. Dry slag shall weigh at least 70 lb/ft³ (1120 kg/m³) compacted and shall contain less than 30% glassy particles by weight. Do not use slag as aggregate for Portland cement concrete.
Synthetic aggregate	Sound, durable, expanded clay, shale, or other manufactured product.

2. Coarse Aggregate Groups
   a. Group I: Limestone, dolomite, marble, or any combination thereof. Ensure Group I aggregates meet the abrasion requirement for Class A stone when used in Portland cement concrete of any type or class.
   b. Group II: Slag, gravel, granitic and gneissic rocks, quartzite, synthetic aggregate, or any combination thereof.
3. Classes

   Aggregates are classified by physical properties that determine how they are used.
   a. Do not blend aggregates that meet abrasion requirements with aggregates that do not meet requirements.
   b. “Class A“ and “Class B” aggregate used in Portland cement concrete, asphaltic concrete, and bituminous surface treatment shall meet these limits:

Percent Wear AASHTO T 96 ("B" Grading)		
	Class A	Class B
Group I Aggregates	0-40	41-55
Group II Aggregates	0-50	51-60

c. "Class B" aggregates used in all applications other than Portland cement concrete, asphaltic concrete, or bituminous surface treatment shall meet these limits:

Percent Wear AASHTO T 96 ("B" Grading)	
	Class B
Group I Aggregates	41-55
Group II Aggregates	51-65

4. Soundness

Test coarse aggregate used in Portland cement concrete, bituminous surfaces, bituminous bases, aggregate bases, or surface treatment with five alternations of the magnesium sulfate soundness test.

a. Use aggregate with a weight loss of less than 15 percent.

b. The 15 percent soundness loss for a Class "CS" concrete is waived if it has a 5-year service record.

c. If the material meets all the requirements except for the 15 percent soundness requirement, the material may be used in Zones 3 and 4 (see Subsection 424.3.05, "Construction Requirements") under the following conditions:

1) The aggregate in bituminous courses and in all types and classes of Portland cement concrete construction, except as stated in Group I, has a satisfactory five-year service record under similar service and exposure.

2) The Engineer's investigation shows that it equals or exceeds the quality of approved aggregate (in cases where the material's uniformity changes at the source, or does not have a five-year service record).

5. Grades

Use coarse aggregate that is well graded within the limits and sizes specified in Table 800.1.

6. Detrimental Substances

a. Detrimental substances include shale, weathered or decomposed rock, friable particles, or any substance that may be detrimental for the use intended..

b. Do not use any aggregate that can cause a deleterious reaction.

c. Do not use aggregates that contain Chrysotile (defined as fibrous serpentinite) as a temporary or permanent unbound surfacing for roads, nor as stabilizer for soil used as subgrade, base, or surface course.

d. Detrimental substances shall not exceed the following limits:

1) For Portland Cement Concrete:

Substance	Max % Allowed
Mica schist—Materials defined in ASTM C 294 as phyllite or schist. Use GDT 104 to analyze these materials.	5
Materials that pass the No. 200 (75 µm) sieve.	1.5
Flat and elongated pieces (with lengths more than five times the average thickness).	10
Sulphur content computed as sulfide sulphur (for bridge-type structures)—If the sulphur content exceeds 0.01%, do not use the aggregate unless it passes a petrographic analysis and a weathering test equivalent to 6 months or more of exposure.	0.01
Other local detrimental substances. (Any Combination)	2.0
NOTE: Do not use aggregate in Portland Cement concrete that is capable of producing a deleterious reaction when combined with Portland Cement.	

2) For Asphaltic Concrete:

Substance	Max. % Allowed
Mica schist—Materials defined in ASTM C 294 as phyllite or schist. Use GDT 104 to analyze these materials. (Use this requirement for Interstate Construction only.)	10
Flat or elongated particles (with lengths more than five times the average thickness).	10
Glassy particles (slag).	30
Other local detrimental substances. (Any combination)	2.0

3) For Bituminous Surface Treatment:

Substance	Max. % Allowed
Mica schist—Materials defined in ASTM C 294 as phyllite or schist. Use GDT 104 to analyze these materials.	10
Material finer than No. 200 (75 µm) sieve. #5 Stone #6 Stone #7 Stone #89 Stone	 0.5 0.7 0.7 1.0
Flat and elongated particles (with lengths more than five times the average thickness).	10
Glassy particles (slag).	30
Other local detrimental substances. (Any combination)	2

e. Ensure that gravel used in asphaltic concrete and bituminous surface treatment meets the following additional requirements:

- Consists of siliceous particles.
- A minimum of 85%, by count, of the material retained on the No. 4 (4.75 mm) sieve has one or more fractured faces.
- The fracture is for the approximate average diameter or thickness of the particle.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Material that passes the No. 200 (75 µm) sieve	AASHTO T 11
Sulphur content	ASTM E 30, Leco method
Weathering	ASTM G 23
Petrographic analysis	ASTM C 295
Soundness (magnesium sulfate)	AASHTO T 104
Percent wear	AASHTO T 96
Aggregate gradation	AASHTO T 27
Reactivity	ASTM C 227, C 289, and C 586
Schist or phyllite	GDT 104
Flat and elongated particles	GDT 129
Friable Particles	GDT 133

D. Materials Warranty

General Provisions 101 through 150.

TABLE 800.1 - SIZES OF COARSE AGGREGATES

SIZE NO	NOMINAL SIZE SQUARE OPENINGS		AMOUNTS FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS). %, BY WEIGHT										
	(1)	mm	2 ½"	2"	1 ½"	1"	¾"	½"	3/8"	No. 4	No. 8	No- 16	No. 50
			63 mm	50 mm	37.5mm	25 mm	19 mm	12.5 mm	9.5 mm	4.75 mm	2.36mm	1.18 mm	300 µm
3	2-1	50 - 25	100	90-100	35-70	00-15	-----	00-5	----	-----	-----	-----	-----
357	2-No. 4	50 - 4.75	100	95-100	-----	35-70	-----	10-30	----	00-5	-----	-----	-----
4	1 ½ -3/4	37.5 - 19	-----	100	90-100	20-55	00-15	-----	00-5	-----	-----	-----	-----
467	1 ½- No. 4	37.5 - 4.75	-----	100	95-100	-----	35-70	-----	10-30	00-5	-----	-----	-----
5	1-1/2	25 – 12.5	-----	-----	100	90-100	20-55	00-10	00-5	-----	-----	-----	-----
56	1-3/8	25 – 9.5	-----	-----	100	90-100	40-75	15-35	00-15	00-5	-----	-----	-----
57	1-No. 4	25 – 4.75	-----	-----	100	95-100	-----	25-60	-----	00-10	00-5	-----	-----
6	¾-3/8	19 – 9.5	-----	-----	-----	100	90-100	20-55	00-15	00-5	-----	-----	-----
67	¾-No. 4	19 – 4.75	-----	-----	-----	100	90-100	-----	20-55	00-10	00-5	-----	-----
68	¾-No. 8	19 –2.36	-----	-----	-----	100	90-100	-----	30-65	05-25	00-10	0-5	-----
7	½-No. 4	12.5 – 4.75	-----	-----	-----	-----	100	90-100	40-70	00-15	00-5	-----	-----
78	½-No. 8	12.5 – 2.36	-----	-----	-----	-----	100	90-100	40-75	05-25	00-10	0-5	-----
8	3/8-No. 8	9.5 – 2.36	-----	-----	-----	-----	-----	100	85-100	10-40	0-10	0-5	-----
89	3/8-No. 16	9.5 – 1.18	-----	-----	-----	-----	-----	100	90-100	20-55	0-15	0-10	0-5
9	No. 4-No. 16	4.75 – 1.18	-----	-----	-----	-----	-----	-----	100	85-100	10-40	0-10	0-5

(1) In inches, except where otherwise indicated. Numbered sieves are those of the United States Standard Sieve Series.

Section 802—Aggregates for Asphaltic Concrete

802.1 General Description

This section includes the requirements for fine and coarse aggregates used in asphaltic concrete.

802.1.01 Definitions

Fine Aggregate: All aggregate passing a No. 8 (2.36 mm) sieve

Coarse Aggregate: All aggregate retained on a No. 8 (2.36 mm) sieve

802.1.02 Related References

A. Standard Specifications

Section 800—Coarse Aggregate

Section 828—Hot Mix Asphaltic Concrete Mixtures

B. Referenced Documents

AASHTO T 27

AASHTO T 96

ASTM C 295

GDT 63

GDT 76

802.2 Materials

802.2.01 Fine Aggregate for Asphaltic Concrete

A. Requirements

Use the appropriate type, group, class, and grade of fine aggregate.

1. Types

   Use fine aggregate made of sharp, strong, angular material meeting the required performance characteristics when combined into a mixture.

   a. Ensure that the aggregate meets the following requirements:

   - Does not contain any deleterious substances.
   - Natural sand is free of organic matter, roots, or twigs.
   - Aggregate is manufactured from Class A or B crushed stone, gravel, slag, or synthetic aggregate that meets the requirements of Section 800.
   - A combination of natural and manufactured sands meets the requirements in Subsection 802.2.01.A.3 and Subsection 802.2.01.A.4 after being combined.

   b. Do not use crushed alluvial gravel as virgin aggregate in any mixture.

2. Groups

   Fine aggregate groups include:

   a. Group I—Limestone, dolomite, marble, or combination thereof

   b. Group II—Gravel, slag, granitic and gneissic rocks, quartzite, natural sand, or a combination thereof

3. Sand Equivalent

   Use these sand equivalent values:

Material	Sand Equivalent Value
Group I	At least 28

Group II	At least 40
Natural sand	At least 25
Blended sand*	Natural sand at least 20; combined blend at least 25
*Blended natural sands or natural sand blended with stone screenings that meet the Group I or Group II sand equivalent limits.	

4. Mica
   a. Use fine aggregate with no more than 35 percent free mica in asphaltic concrete surface mixes.
   b. When approved by the Engineer, use fine aggregate with more than 35 percent mica if blended with natural sand or sand manufactured from Group II aggregates. Ensure the blend has no more than 35 percent free mica and meets all other requirements of this Section, Section 800 and Section 828.
5. Aggregate for Stone Matrix Asphalt

   Manufactured screenings will be considered as fine aggregate and shall contain no more than 20 percent by weight coarser than a No. 4 (4.75 mm) sieve.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test the fine aggregate as follows:

Test	Method
Aggregate gradation	AASHTO T 27
Sand equivalent	GDT 63
Mica content	GDT 76 or ASTM C 295

D. Materials Warranty

General Provisions 101 through 150.

802.2.02 Coarse Aggregate for Asphaltic Concrete

A. Requirements

1. Types

   Ensure coarse aggregate meets the following requirements:

   - Class A or B crushed stone, gravel, slag, or synthetic aggregate as in Subsection 800.2.
   - Have uniform quality throughout without any deleterious substances.
   - Meet the required performance characteristics when combined into a mixture.

   NOTE: Do not use alluvial gravel as virgin aggregate.

2. Groups

   Coarse aggregate shall be one of either group below as specified in the composition Table in Subsection 828.2.A.2:

   - Group I—Limestone, dolomite, marble, or combination thereof
   - Group II—Gravel, slag, granite and gneissic rocks, quartzite, or combination thereof
3. Aggregate for Stone Matrix Asphalt

   Use coarse aggregate that meets requirements of this Section and Section 800 except as follows:

   - Use Class A aggregate only with percent wear of each individual size not to exceed 45 percent based on the B grading of AASHTO T 96
   - Use aggregate which contains no more than 20 percent flat and elongated pieces (length greater than three times the average thickness) for that portion of the blend of all aggregate retained on the No. 4 (4.75 mm) sieve.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Coarse Aggregate	Subsection 800.2.01.C

D. Materials Warranty

General Provisions 101 through 150.

Section 820—Asphalt Cement

820.1 General Description

This Section includes the requirements for asphalt cements prepared from crude petroleum.

820.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

Standard Operating Procedure (SOP 4)

AASHTO TP 1

AASHTO TP 3

AASHTO TP 5

AASHTO T 48

AASHTO TP 48

AASHTO T 179

AASHTO T 240

820.2 Materials

820.2.01 Asphalt Cement

A. Requirements

1. Type

   Use a material that is homogenous and water-free and that does not foam when heated to 347 °F (175 °C).

   Ensure that a blend used to produce a specified performance grade meets the following requirements:

   - Is uniform and homogeneous without separation
   - Uses PG 64-22 or PG 67-22 described below for the base asphalt
   - Consists of production materials that have not been “air-blown” to achieve the performance grade

2. Grade

   Use the various grades of asphalt cement that meet the requirements shown in the test requirements for Petroleum Asphalt Cements

   Add only Styrene-Butadiene-Styrene (SBS) or Styrene-Butadiene (SB) to neat asphalt to produce a binder that meets requirements for PG 76-22.

Test Requirements for Petroleum Asphalt Cements

Test And Method	Test Temperature				Original Binder	Residue Of Binder After:	
	PG 58-22	PG 64-22	PG 67-22	PG 76-22		Rolling Thin-Film Oven AASHTO: TP5	Pressure Aging AASHTO: PP-1
Flash Point, AASHTO: T-48 Min.					446 °F (230 °C)		
Viscosity (a), AASHTO:TP-48 Max.	275 °F (135 °C)				3Pa-S (3000CP)		
Mass Loss (%), Max. AASHTO: T-240 (b)						0.5	
Dynamic Shear, G*/sinδ, AASHTO: TP5, 10 Rad/Sec	136 °F (58 °C)	147 °F (64 °C)	153 °F (67 °C)	169 °F (76 °C) Phase Angle	≥ 1.0 kPa ≤ 75 deg.	≥ 2.2 kPa	
Dissipated Energy, Dynamic Shear, G*sinδ, AASHTO: TP5, 10 Rad/Sec	77 °F (25 °C)						≤ 5000 kPa
Creep Stiffness (c), 60 sec. AASHTO TP1	10 ° F (- 12 °C)						S ≤ 300 000 kPa m ≥ 0.300
Direct Tension, 1.0 mm/min. AASHTO: TP3, Failure Strain	10 ° F (- 12 °C)						Report

a. The Department may waive this requirement if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

b. Heat loss by AASHTO T 179 may be accepted in lieu of mass loss by AASHTO T 240.

c. If the creep stiffness is below 300 000 kPa, the direct tension test is not required. If the creep stiffness is ≥300 000 kPa, report the Direct Tension Failure Strain value. Satisfy the m-value

requirement in either case.

If modification is required, thoroughly blend the composite materials at the supply facility prior to being loaded into the transport vehicle. Ensure all blending procedures, formulation, and operations are approved by the Office of Materials and Research.

3. Certification: Provide certified test results from an approved, certified laboratory of blends for proposed PG asphalt for each specification characteristic of the asphalt cement proposed for shipment. Provide the certified results to the State Materials and Research Engineer as required in Standard Operating Procedure (SOP 4).

   In the event there is reason to suspect a sample will be outside specification limits, the State Materials and Research Engineer may interrupt production until test results are known.

B. Materials Warranty

General Provisions 101 through 150.

Section 828—Hot Mix Asphaltic Concrete Mixtures

828.1 General Description

This specification includes the requirements for hot mix asphaltic concrete mixtures, including:

- Open-graded surface mixtures
- Stone Matrix Asphalt mixtures
- Superpave asphaltic concrete mixtures
- Fine-graded mixtures

828.1.01 Definitions

Nominal Maximum Sieve Size: One standard sieve size larger than the first sieve to retain more than ten percent.

828.1.02 Related References

A. Standard Specifications

Section 800–Coarse Aggregate

Section 802–Aggregates for Asphaltic Concrete

Section 820–Asphalt Cement

Section 831–Admixtures

B. Referenced Documents

AASHTO TP 4

AASHTO PP 2

AASHTO TP 8-94

AASHTO T 112

AASHTO T 209

AASHTO T 305

Standard Operating Procedure (SOP) 2 SP–Control of Superpave Bituminous Mixture Designs

GDT 4

GDT 56

GDT 66

GDT 115

GDT 125

QPL 26

QPL 41

828.2 Materials

A. Requirements

All mixtures are designated based on the Nominal Maximum Sieve Size. Determine the amount finer than No. 200 (75 µm) by washing (See GDT 4) or by the correlation procedure described in GDT 125.

Use hot mix asphaltic concrete mixtures that meet the following requirements:

1. Ensure the materials used to prepare the mixtures are approved by the Engineer before incorporating into the Work.
2. Use aggregate groups and blends that meet the following pay item designations, as indicated in the Proposal and Plans:

Pay Item Designation	Allowable Aggregate Groups
Group I or II	100% of Group I, Group II, or Blend I.
Group II only	Only 100% Group II.
Blend I	Either 100% Group II material or a blend of Group I and Group II. Do not use Group I material for more than 60% by weight of the total aggregates, nor more than 50% by weight of the coarse aggregate portion.

3. Use Group I, Group II, or a blend of both aggregate groups, for patching or leveling. Mixes are listed in Subsection 828.2.03 and Subsection 828.2.04.
4. Design mixes using the Superpave System for Volumetric Design (AASHTO TP 4 and AASHTO PP 2) unless stated otherwise. Designs shall be performed by qualified and approved laboratories and technicians as specified in SOP-2 SP - Control of Superpave Bituminous Mixture Designs.
5. Ensure individual test results meet Mixture Control Tolerances
6. Include hydrated lime in all paving courses except where noted. For a list of hydrated lime sources, see QPL 41.
   a. Add lime to virgin aggregate mixtures at a minimum rate of 1 percent of the total dry aggregate weight.
   b. Add lime to recycled mixtures at a minimum rate of 1 percent of the virgin aggregate portion, plus a minimum of 0.5 percent of the aggregate in the reclaimed asphalt pavement (RAP) portion.
   c. Add more lime and an approved heat-stable, anti-stripping additive that meets the requirements of Subsection 831.2.04, "Heat Stable Anti-Stripping Additive," if necessary, to meet requirements for mixture properties. However, the Department will not pay for the additional required materials. For a list of Heat Stable Anti-Stripping Additive sources, please see QPL 26.
   d. On PR, LARP, airport, bridge replacement, and parking lot projects designated at Mix Design Level A, asphalt cement may include an approved, heat-stable, anti-stripping additive that meets the requirements of Subsection 831.2.04, "Heat Stable Anti-Stripping Additive" instead of hydrated lime, unless specified in the Pay Item.
      1) Add at a minimum rate of 0.5 percent of the AC portion.
      2) Ensure the additive treated mix meets the minimum tensile splitting ratio:

Tensile Splitting Ratio	Type of Asphaltic Concrete
0.4	4.75 mm mix
0.6	All other mixes

7. Use performance grade PG 67-22 asphalt cement in all mixtures except as follows:
   a. For RAP mixtures, the Engineer will determine the performance grade to be used.
   b. On PR, LARP, airport, bridge replacement, and parking lot projects, PG 64-22 may be substituted for PG 67-22.
   c. Use only performance grade PG 76-22 for all mixtures that specify polymer-modified asphalt in the pay item designation.
8. Use of local sand is restricted as follows:
   a. No more than 20 percent, based on total aggregate weight, may be used in mixtures for shoulder construction and on projects designed at Mix Design Level A.
   b. For mixtures placed on the mainline traveled way of projects designed at Mix Design Level B, C, or D (except interstate projects), local sand may be used only in the 25 mm Superpave and shall not exceed 20 percent based on total aggregate weight.
   c. Do not use local sand in any mixture placed on the traveled way of Interstate mainline or ramps. No more than 20 percent local sand, based on total aggregate weight, may be used in mixtures for shoulder construction.
   d. Do not use local sand that contains more than 7 percent clay.
   e. Do not use local sand that contains any clay lumps as determined by AASHTO T 112.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Ensure the mix design has been reviewed and approved by the Department prior to beginning production.

1. Rutting Susceptibility Testing
   a. Fabricate three beams or six cylindrical specimens from each asphalt mix for the test using GDT 115.
   b. Design mixtures which meet the following criteria for rutting where tested using GDT 115:
   c. Mix Design Level A – 0.3 in (7 mm) maximum
      - Mix Design Level B – 0.25 in (6 mm) maximum
      - Mix Design Level C & D – 0.2 in. (5 mm) maximum

      Mixtures designed prior to July 1, 2001 which do not exceed 0.2 in (5 mm) rutting when tested at 120 ºF (49 ºC) using GDT 115 may be acceptable.

   Tests will not be required for mixtures designed exclusively for trench widening nor for the 4.75 mm mix, nor for open-graded surface mixtures.
2. Fatigue Testing

   The Department may perform the test according to AASHTO TP 8-94 or other Department approved procedure.

D. Materials Warranty

General Provisions 101 through 150.

828.2.01 Open-Graded Surface Mixture

A. Requirements

1. Use the information in the following table for job mix formulas and design limits:

Mixture Control Tolerance	Asphaltic Concrete	9.5 mm OGFC	12.5 mm OGFC	12.5 mm PEM
	Grading Requirements	**Percent Passing**		
±0.0	3/4 in (19 mm) sieve		100	100
±6.1	1/2 in (12.5 mm) sieve	100*	85-100	80-100
±5.6	3/8 in (9.5 mm) sieve	85-100	55-75	35-60
±5.7	No. 4 (4.75 mm) sieve	20-40	15-25	10-25
±4.6	No. 8 (2.36 mm) sieve	5-10	5-10	5-10
±2.0	No. 200 (75 µm) sieve	2-4	2-4	1-4
	Design Requirements			
±0.4	Range for % AC	6.0-7.25	5.75-7.25	5.5-7.0
	Class of stone (Section 800)	"A" only	"A" only	"A" only
	Coating retention (GDT-56)	95	95	95
	Drain-down, AASHTO T 305 (%)	<0.3	<0.3	<0.3

* Mixture control tolerance not applicable to this sieve for this mix.

2. Use only PG 76-22 (specified in Section 820) in the 12.5 mm OGFC and 12.5 mm PEM mixtures.
3. Use a stabilizing fiber, which meets the requirements of Section 819 in 12.5 mm OGFC and 12.5 mm PEM mixtures. The dosage rate will be as recommended by the Engineer and shall be sufficient to prevent excessive drain-down.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

828.2.02 Stone Matrix Asphalt Mixtures

A. Requirements

Use the information in the following table for the job mix formula and design limits.

Mixture Control Tolerance	Asphaltic Concrete	9.5 mm SMA	12.5 mm SMA	19 mm SMA
	Grading Requirements	**Percent Passing**		
±0.0	1- in (25 mm) sieve			100
±7.0	3/4 in (19 mm) sieve		100*	90-100
±6.1	1/2 in (12.5 mm) sieve	100*	85-100	44-70
±5.6	3/8 in (9.5 mm) sieve	70-100	50-75	25-60
±5.7	No. 4 (4.75 mm) sieve	28-50	20-28	20-28
±4.6	No. 8 (2.36) mm sieve	15-30	16-24	15-22
±3.8	No. 50 (300 µm) sieve	10-17	10-20	10-20
±2.0	No. 200 (75 µm) sieve	8-13	8-12	8-12
	Design Requirements			
±0.4	Range for % AC	6.0-7.5	5.8-7.5	5.5-7.5
	Design optimum air voids (%)	3.5 ±0.5	3.5 ±0.5	3.5 ±0.5
	% aggregate voids filled with AC (VFA)	70-90	70-90	70-90
	Tensile splitting ratio after freeze-thaw cycle GDT-66	80%	80%	80%
	Drain-down AASHTO T 305 (%)	<0.3	<0.3	<0.3

* Mixture control tolerance not applicable to this sieve for this mix.

1. Compact SMA mixtures at 50 gyrations with the Superpave Gyratory compactor or 50 blows with the Marshall compactor.
2. A Tensile splitting ratio of no less than 70% may be acceptable so long as all individual test values exceed 100 psi (690 kPa).
3. Stone Matrix Asphalt mixtures shall contain asphalt cement, mineral filler, and fiber stabilizing additives which meet the following requirements:
   a. Use asphalt cement that meets requirements of PG 76-22 of Section 820.
   b. Use mineral filler that meets requirements of Section 883 and has been approved by the Engineer. Local sand shall not be used in lieu of mineral filler.
   c. Treat these mixes with a fiber-stabilizing additive, which meets the requirements of Section 819. The dosage rate will be as recommended by the Engineer and shall be sufficient to prevent excessive drain-down.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

See Subsection 828.2.C.

D. Materials Warranty

General Provisions 101 through 150.

828.2.03 Superpave Asphaltic Concrete Mixtures

A. Requirements

Use the information in the following table for job mix formula and design limits:

Mixture Control Tolerance	Asphaltic Concrete	9.5 mm Superpave Level A	9.5 mm Superpave Level B,C,D	12.5 mm Superpave	19 mm Superpave	25 mm Superpave
	Grading Requirements	Percent Passing				
	1-1/2 in (37.5 mm) sieve					100
± 8.0	1- in (25.0 mm) sieve				100*	90-100
±8.0	3/4 in (19.0 mm) sieve			100*	90-100	55-89
±6.0**	1/2 in (12.5 mm) sieve	100*	100*	90-100	60-89	50-70
±5.6	3/8 in (9.5 mm) sieve	90-100	90-100	70-85	55-75	
±5.6	No. 4 (4.75 mm) sieve	65-85	55-75			
±4.6	No. 8 (2.36 mm) sieve	53-58	42-47	34-39	29-34	25-30
±2.0	No. 200 (75 µm) sieve	4.0-7.0	4.0-7.0	3.5-7.0	3.5-6.0	3.0-6.0

* Mixture control tolerance not applicable to this sieve for this mix.

**Mixture control tolerance shall be ± 8.0% for this sieve for 19 mm Superpave.

Superpave mixtures shall also meet the following requirements:

1. The Mixture Control Tolerance for asphalt cement shall be ± 0.4%.
2. Volumetric Criteria

Design Parameter	Design Criteria
a. Percent of Maximum Specific Gravity (%G_{mm}) at the design number of gyrations, (N_d) (See Note 1)	96%
b. % G_{mm} at the initial number of gyrations, (N_i)	Level A <91.5% Level B <90.5% Level C & D <89%
c. Percent voids in mineral aggregate (VMA) at N_d	See Table 828.2.03.A.3
d. Percent voids filled with asphalt (VFA) at N_d	See Table 828.2.03.A.4
e. Fines to effective asphalt binder ratio (F/P_{be})	
1) Asphaltic concrete 9.5 mm Superpave (Level A)	0.6-1.2
2) All Superpave mixtures excluded in Item 1	0.8-1.6
f. Tensile strength (GDT 66)	
1) Ratio (See Note 2)	80% min.
2) Stress	60 psi (414 kPa) min.
g. Retention of Coating (GDT 56)	95% min.

Note 1: Maximum specific gravity (G_{mm}) determined in accordance with AASHTO T 209.

Note 2: A tensile splitting ratio of no less than 70% may be acceptable so long as all individual test values exceed 100 psi (690 kPa).

3. VMA Criteria

Nominal Maximum Sieve Size	Minimum % VMA*
1 in (25 mm)	12
3/4 in (19 mm)	13
1/2 in (12.5 mm)	14
3/8 in (9.5)	15

* VMA is to be determined based on effective specific gravity of the aggregate (G_{se}).

4. VFA Criteria

MIX DESIGN LEVEL	RANGE % VFA	
	Minimum	Maximum
A	67	80
B	65	78
C	65	76
D	65	75

5. Superpave Gyratory Compaction Criteria

MIX DESIGN LEVEL	NUMBER OF GYRATIONS	
	N_i	N_d
A	6	50
B	7	75
C	8	100
D	9	125

Use mix Design Level A for all Superpave mixes used as shoulder surface mixture, trench widening, temporary detour, or sub-base mixture under Portland cement concrete pavement unless specified otherwise in the plans.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

See Subsection 828.2.C.

D. Materials Warranty

General Provisions 101 through 150.

828.2.04 Fine Graded Mixtures

A. Requirements

Use the following table for the job mix formula and design limits:

ASPHALTIC CONCRETE - 4.75 mm Mix		
MIXTURE CONTROL	GRADING	

TOLERANCE	REQUIREMENTS	% Passing
±0.0	1/2 in (12.5 mm) sieve	100*
±5.6	3/8 in (9.5 mm) sieve	90-100
±5.7	No. 4 (4.75 mm) sieve	75-95
±4.6	No. 8 (2.36 mm) sieve	60-65
±3.8	No. 50 (300 μm) sieve	20-50
±2.0	No. 200 (75 μm) sieve	4-12
	DESIGN REQUIREMENTS	
±0.4	Range for % AC	6.00-7.50
	Design optimum air voids (%)	4-7
	% Aggregate voids filled with AC	50-80
	Tensile splitting ratio after freeze-thaw cycle (GDT 66)	80% minimum

* Mixture control tolerance not applicable to this sieve for this mix.

Design this mixture at Superpave Mix Design Level A.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

General Provisions 101 through 150.

D. Materials Warranty

General Provisions 101 through 150.

Section 883—Mineral Filler

883.1 General Description

This section covers mineral filler added as a separate ingredient for use in bituminous paving mixtures. Use mineral filler that consists of finely divided mineral matter such as rock dust, slag dust, hydrated lime, hydraulic cement, fly ash, or other suitable mineral filler. Ensure that at the time of use it is sufficiently dry, flows freely, and is free from lumps.

883.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

AASHTO PP 1

AASHTO T 90

AASHTO T 240

AASHTO TP 1

AASHTO TP 5

GDT 4

883.2 Materials

883.2.01 Mineral Filler

A. Requirements

Mineral filler shall be graded within the following limits:

Sieve Size	Percent Passing
No. 30 (600 μm)	100
No. 50 (300 μm)	95-100
No. 200 (75 μm)	55-100

Ensure that the mineral filler is free from organic impurities and has a plasticity index not greater than 4. Plasticity index limits are not appropriate for hydrated lime and hydraulic cement.

Thoroughly blend mineral filler to be used in Stone Matrix Asphalt mixtures with asphalt cement and fiber stabilizing additives into a homogenous mixture. The total fine mortar shall then meet the following requirements:

Test	Specification
Unaged DSR, G*/sinδ(kPa)	5 minimum
RTFO Aged DSR, G*/sinδ(kPa)	11 minimum
PAV Aged BBR, Stiffness (MPa)	1500 maximum

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Sieve Analysis of Mineral Filler	GDT 22*
Plasticity Index	AASHTO T 90
* A laser diffraction particle size distribution analyzer may be used in lieu of this test.	

Mortar Properties to be based on NCAT procedure for Laboratory Preparation and Testing of HMA Mortars using AASHTO T240, AASHTO PP1, AASHTO TP1, and AASHTO TP5.

D. Materials Warranty

General Provisions 101 through 150.

Russell R. McMurry, P.E., Commissioner
One Georgia Center
600 West Peachtree Street, NW
Atlanta, GA 30308
(404) 631-1000 Main Office

October 24, 2018
BITUMINOUS CONSTRUCTION BULLETIN

TO ALL ASPHALTIC CONCRETE PRODUCERS FOR GEORGIA DEPARTMENT OF TRANSPORTATION PROJECTS

RE: Hamburg Wheel Tracking Device

As reported in the Bituminous Bulletin dated October 27, 2015, the Office of Materials and Testing detailed the Department's plan to implement AASHTO T 324 - Hamburg Wheel Tracking Device (HWTD) testing in lieu of AASHTO T 340 - Asphalt Pavement Analyzer (APA) rut testing for asphaltic concrete mix design acceptance. As most of you are aware, the Georgia Department of Transportation has required acceptable APA test results for determining rutting susceptibility for all asphaltic concrete mixtures prior to mix design approval since the late 1990s.

Over the last 24 months, GDOT has been testing and evaluating asphaltic concrete mixtures' performance using the Hamburg Wheel Tracking Device (HWTD). Currently, GDOT and several asphalt concrete mix design laboratories are using specimen preparation and testing procedures established in AASHTO T 324. In review of the laboratory and actual field performance of asphalt mixtures approved using the HWTD testing, it appears that acceptable performance has been obtained. As such, when performing HWTD testing GDOT will continue to use AASHTO T 324, with the given criteria in Table 1.

PG Grade	Mix Type	Number of Passes	Maximum Rut Depth
PG 64-22 and PG 67-22	4.75 mm, 9.5 mm SP TP I, and 9.5 mm TP II,	15,000*	12.5 mm (0.5 inch)
PG 64-22 and PG 67-22	12.5 mm SP, 19 mm SP and 25 mm SP	20,000**	12.5 mm (0.5 inch)
PG 76-22	All Mix Types	20,000**	12.5 mm (0.5 inch)
*Stripping Inflection Point (SIP) Shall Not Occur Prior to 15,000 Passes			
**Stripping Inflection Point (SIP) Shall Not Occur Prior to 20,000 Passes			

Beginning November 1, 2018, Section 828 of the Georgia Department of Transportation's specifications will require the use of the HWTD, for evaluating the rutting and moisture damage susceptibility for all asphaltic concrete mix designs submitted for initial approval in lieu of the APA and generally GDT 66 (Evaluating the Moisture Damage Susceptibility of Asphalt Mixtures). Additionally, this office will accept satisfactory HWTD test results, in lieu of absorption recovery and recovered binder testing, for asphaltic concrete mixtures containing ≤ 35 percent RAP. For mixtures containing > 35 percent RAP,

abson recovery and recovered binder testing will be required. All HWTD specimen fabrication and testing procedures shall be in accordance with AASHTO T 324, with the acceptance criteria as detailed in Table 1. GDOT will require that all specimens be gyrated samples (150 mm diameter) and meet height in accordance with AASHTO T 324 and air void requirements of 7 ± 1 percent.

All asphaltic concrete mix designs approved prior to November 1, 2018 will require new field mix design verification testing including HWTD at next plant production for each mix. Field mix design verification samples are to be submitted to each District laboratory, other than District 1, Gainesville which currently does not have the HWTD. Mixtures produced in the immediate metro Atlanta area are to be submitted to the Asphalt Design Unit in Forest Park, Georgia.

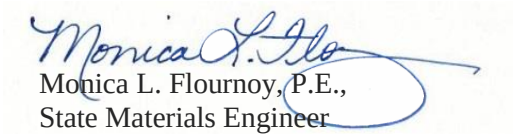
Another change in GDOT's mix design process are revisions in SOP 2 "Standard Operating Procedure for Control of Superpave Bituminous Mixture Designs" and GDT 123 "Determining the Design Properties of Stone Matrix Asphalt Mixtures" to the Corrected AC Content (COAC) calculation. Currently, GDOT uses a Credited AC Content factor of 0.75 for RAP binder contribution for all mix types incorporating Recycled Asphalt Pavement (RAP). **The revisions modify the Credited AC Content factor to 0.60 for all mixtures.**

In order to more easily facilitate this change, GDOT is providing the following guidelines in reference to currently approved mixtures. "For asphaltic concrete mix designs approved prior to **January 1, 2019**, the new COAC may be recalculated from an existing approved mix design. A new mix identification number will be required. Upon first production of the recalculated surface mix design, field verifications using asphalt plant produced mixture will be required. Final approval of the recalculated mix design will be dependent on the field verified mixture meeting specified criteria using AASHTO T 324". Contractors and/or designers should include a formal letter of request with a list of mix designs including mix identification numbers, copies of the existing mix design cover sheet and recalculated COAC for all mixes submitted for this revision. New mix designs will be handled on a first come, first serve basis with the understanding that a monumental amount of request are anticipated and this endeavor will be handled as quickly and efficiently as possible.

Your cooperation and assistance in making this transitional effort towards improving the overall quality of the asphaltic concrete placed on GDOT roads is greatly appreciated!

Please contact James Brandon at (404) 608-4862 if you have any additional questions in regards to this matter.

Sincerely,



Monica L. Flournoy, P.E.,
State Materials Engineer

MLF:PW:sh
cc: Marc Mastronardi, P.E., Director of Construction
John Hancock, P.E., State Construction Engineer
GHCA
GAPA