STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

May 20, 2010

CEDAR CITY COURTS
PARKING LOT IMPROVEMENTS

ADMINISTRATIVE OFFICE OF THE COURTS

CEDAR CITY, UTAH

DFCM Project Number 09104150

Johansen & Tuttle Engineering, Inc.
P. O. Box 487
Castle Dale, Utah 84513

TABLE OF CONTENTS

	Page Numbers
Title Sheet	1
Table of Contents	2
Notice to Contractors	3
Project Description	4
Project Schedule	5
Bid Form	6
Instructions to Bidders	8
Bid Bond	12
Instructions and Subcontractors List Form	13
Contractor's Agreement	16
Performance Bond	21
Payment Bond	22
Certificate of Substantial Completion	23
General Contractor Past Performance Rating Form	
Technical Specifications:	
Drawings:	

Current copies of the following documents are hereby made part of these contract documents by reference These documents are available on the DFCM web site at http://dfcm.utah.gov/StdDocs/index.html "Standard Documents" – "Reference Documents I" – "Item 7. Supplemental General Conditions" or are available upon request from DFCM:

DFCM Supplemental General Conditions revised May 11, 2010 *
DFCM Supplemental General Conditions dated July 1, 2009 *
DFCM Supplemental General Conditions dated July 15, 2008
DFCM General Conditions dated May 25, 2005
DFCM Application and Certification for Payment dated May 25, 2005.

*** NOTE: THE NEW SUPPLEMENTAL GENERAL CONDITIONS EFFECTIVE JULY 1, 2009 AND REVISED MAY 11, 2010 ADDRESSING HEALTH INSURANCE AND IMMIGRATION ARE REFERENCED AT THE LINK ABOVE.**

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

NOTICE TO CONTRACTORS

Sealed bids will be received by the Division of Facilities Construction and Management (DFCM) for:

CEDAR CITY COURTS PARKING LOT IMPROVEMENTS
ADMINISTRATIVE OFFICE OF THE COURTS – CEDAR CITY, UTAH
DFCM PROJECT NO: 09104150

Bids will be in accordance with the Contract Documents that will be available on **Thursday, May 20, 2010** and distributed in electronic format only on CDs from DFCM, 4110 State Office Building, Salt Lake City, Utah and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Brent Lloyd, DFCM, at 801-550-5882. No others are to be contacted regarding this bidding process. The construction estimate for this project is $87,000.00.

A **mandatory** pre-bid meeting will be held at **11:00 AM on Tuesday, May 25, 2010** at Cedar City Courts, 40 North 100 East, Cedar City, Utah. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of **2:30 PM on Wednesday, June 2, 2010** at DFCM, 4ll0 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. NOTE: Bids must be received at 4110 State Office Building by the specified time.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid.

The Division of Facilities Construction and Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of DFCM.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
Joanna Reese, Contract Coordinator
4110 State Office Building, Salt Lake City, Utah 84114

PROJECT DESCRIPTION

This project consists of a 2” asphalt overlay with fabric on the entire parking lot (approximately 35,000 SF) of the Cedar City Courts Building located on 40 North 100 East, Cedar City, Utah. It includes concrete sidewalk replacement, asphalt patching, roto-mill and re-striping of the parking lot.

The project will be accomplished during hours of operation for the Facility. Therefore, coordination with the Facilities Staff will be important. The Contractor will be responsible for maintaining a safe work-site at all time and shall be responsible for coordinating pedestrian traffic flow as well as vehicular traffic using all necessary signage and barricades.

PROJECT SCHEDULE

PROJECT NAME: **Cedar City Courts Parking Lot Improvements**
Administrative Office of the Courts – Cedar City, Utah
DFCM PROJECT NO. 09104150

Event	Day	Date	Time	Place
Bidding Documents Available	Thursday	May 20, 2010	2:00 PM	DFCM 4110 State Office Bldg SLC, UT and the DFCM web site *
Mandatory Pre-bid Site Meeting	Tuesday	May 25, 2010	11:00 AM	Cedar City Courts 40 North 100 East Cedar City, Utah
Last Day to Submit Questions	Wednesday	May 26, 2010	2:00 PM	In Writing To: Brent Lloyd – DFCM brentlloyd@utah.gov Fax 801-538-3267
Addendum Deadline (exception for bid delays)	Thursday	May 27, 2010	4:00 PM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Wednesday	June 2, 2010	2:30 PM	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Thursday	June 3, 2010	2:30 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	July 30, 2010		

* **NOTE: DFCM's web site address is http://dfcm.utah.gov**

BID FORM

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the **Cedar City Courts Parking Lot Improvements – Administrative Office of the Courts - Cedar City, Utah DFCM Project 09104150** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

ITEM	WORK OR MATERIAL	UNIT	QTY	UNIT PRICE	AMOUNT
1	MOBILIZATION	L.S.	1	$	$
2	HMA (1/2-INCH MIX) 2-INCH OVERLAY	SQ.FT	34,970	$	$
3	HMA (1/2-INCH MIX) 3-INCHES THICK	SQ.FT.	1,330	$	$
4	PAVING FABRIC (PETROMAT)	SQ.YD.	3,885	$	$
5	REMOVE ASPHALT	SQ.FT.	1,030	$	$
6	CRACK SEAL	L.F.	2,020	$	$
7	ROTOMILL	SQ.FT.	3,545	$	$
8	EXCAVATION	SQ.FT.	300	$	$
9	UNTREATED BASE COURSE	SQ.FT.	300	$	$
10	GRANULAR BORROW 6-INCH MIN.	SQ.FT.	300	$	$
11	STABILIZATION FABRIC (COMBIGRID 30/30)	SQ.YD.	35	$	$
12	RECONSTRUCT UTILITY ACCESS	EACH	3	$	$
13	RECONSTRUCT INLET BOX	EACH	2	$	$
14	REMOVE RAMP	EACH	2	$	$
15	REMOVE SIDEWALK	SQ.FT.	160	$	$

16	CURB WALL	L.F.	10	$ _____	$ _____
17	CONCRETE CURB BLOCK	EACH	9	$ _____	$ _____
18	PAVEMENT MARKING	L.S.	1	$ _____	$ _____
			TOTAL BID...$	_____	

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by July 30, 2010, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$500.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in the Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract.

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization:
_____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

Respectfully submitted,

_____
Name of Bidder
ADDRESS:
_____

_____
Authorized Signature

INSTRUCTIONS TO BIDDERS

1. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Invitation to Bid.

2. Bids

Before submitting a bid, each contractor shall carefully examine the Contract Documents, shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Invitation to Bid prior to the deadline for submission of bids.

A bid bond properly signed by a qualified surety, as indicated on the DFCM Bid Bond form provided along with this Instruction to Bidders, in the amount of 5% of the bid, shall accompany the bid submission to DFCM. THIS BID BOND MUST BE ON THE DFCM BID BOND FORM PROVIDED WITH THIS INSTRUCTION TO BIDDERS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID unless only one bid is received by DFCM, or the failure to comply with the bid bond requirements is determined by the Director of DFCM to be nonsubstantial based on the following:

(a) the bid bond is submitted on a form other than DFCM's required Bid Bond form and the bid bond meets all other requirements including being issued by a surety firm authorized to do business in the State of Utah and be listed in the U.S. Department of the Treasury Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies for an amount not less than the amount of the bond to be issued. A co-surety may be utilized to satisfy this requirement; and

(b) the contractor provides a bid bond properly signed by a qualified surety and on the required DFCM Bid Bond form by the close of business of the next succeeding business day after the DFCM notifies the bidder of the defective bid bond.

3. Contract and Bond

The Contractor's Agreement will be in the form provided in this document. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the contract sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for subcontractors will be specified in the Supplementary General Conditions.

4. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The Subcontractors List shall be delivered to DFCM or faxed to DFCM at 801-538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contracts for a period of up to three years.

5. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Project Manager a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addenda posted on DFCM's web site at http://dfcm.utah.gov. Neither the DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

6. Addenda

Addenda will be posted on DFCM's web site at http://dfcm.utah.gov. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda may result in disqualification from bidding.

7. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

8. DFCM Contractor Performance Rating

As a contractor completes each DFCM project, DFCM, the architect/engineer and the using agency will evaluate project performance based on the enclosed "DFCM Contractor Performance Rating" form. The ratings issued on this project will not affect this project but may affect the award on future projects.

9. Licensure

The Contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

10. Permits

In concurrence with the requirements for permitting in the General Conditions, it is the responsibility of the Contractor to obtain the fugitive dust plan requirements from the Utah Division of Air Quality and the SWPPP requirements from the Utah Department of Environmental Quality and submit the completed forms and pay any permit fee that may be required for this specific project. Failure to obtain the required permit may result in work stoppage and/or fines from the regulating authority that will be the sole responsibility of the Contractor. Any delay to the project as a result of any such failure to obtain the permit or noncompliance with the permit shall not be eligible for any extension in the Contract Time.

11. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

12. Time is of the Essence

Time is of the essence in regard to all the requirements of the Contract Documents.

13. Withdrawal of Bids

Bids may be withdrawn on written request received from bidder prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

14. Product Approvals

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

15. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the contractor, subcontractor or sub-subcontractor.

16. Debarment

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by DFCM as part of the requirements for award of the Project.

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and_____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the_____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By:_____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By:_____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone:

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, based on the following:

DOLLAR AMOUNTS FOR LISTING

PROJECTS UNDER $500,000: ALL FIRST-TIER SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE: ALL FIRST-TIER SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- If there are no subcontractors for the job that are required to be reported by State law (either because there are no subcontractors that will be used on the project or because there are no first-tier subcontractors over the dollar amounts referred to above), then you do not need to submit a sublist. If you do not submit a sublist, it will be deemed to be a representation by you that there are no subcontractors on the job that are required to be reported under State law. At any time, DFCM reserves the right to inquire, for security purposes, as to the identification of the subcontractors at any tier that will be on the worksite.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for

such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONTRACTOR LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self" *	$300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	$298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: $350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

* Bidders may list "self", but it is not required.

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

FAX TO 801-538-3677

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR OWNER'S REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY OWNER. ATTACH A SECOND PAGE IF NECESSARY.

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 and Supplemental General Conditions dated July 15, 2008, July 1, 2009, and revised May 11, 2010 ("also referred to as General Conditions") on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which is the base bid, and which sum also includes the cost of a 100% Performance Bond and a 100%

Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete by _____. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Invitation to Bid, Instructions to Bidders/ Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the Contractor requests payment and agrees to

safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor’s Agreement. The Contractor shall not assign this Contractor’s Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor’s Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____)

_____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
David D. Williams, Jr. Date
DFCM Administrative Services Director

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
Lynn A. Hinrichs Date
Assistant Director Construction Management

APPROVED AS TO FORM:
ATTORNEY GENERAL
May 11, 2010
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____ (Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____ (Seal)

Attorney-in-Fact

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20___, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____

Agent: _____

Address: _____

Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____ (Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20_____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____

AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

The Owner acknowledges receipt of the following closeout and transition materials:

As-built Drawings O & M Manuals Warranty Documents Completion of Training Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of _____(Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ ____calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: $_____. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

_____ by: _____

CONTRACTOR (include name of firm) (Signature) DATE

_____ by: _____

A/E (include name of firm) (Signature) DATE

_____ by: _____

USING INSTITUTION OR AGENCY (Signature) DATE

_____ by: _____

DFCM (Owner) (Signature) DATE

4110 State Office Building, Salt Lake City, Utah 84114 cc: Parties Noted

telephone 801-538-3018 • facsimile 801-538-3267 • http://dfcm.utah.gov DFCM, Director

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

General Contractor Performance Rating Form

Project Name:		DFCM Project#	
Contractor: (ABC Construction, John Doe, 111-111-1111)	A/E: (ABC Architects, Jane Doe, 222-222-2222)	Original Contract Amount:	Final Contract Amount:
DFCM Project Manager:		Contract Date:	
Completion Date:		Date of Rating:	

Rating Guideline	QUALITY OF PRODUCT OR SERVICES	COST CONTROL	TIMELINESS OF PERFORMANCE	BUSINESS RELATIONS
5-Exceptional	Contractor has demonstrated an exceptional performance level in any of the above four categories that justifies adding a point to the score. Contractor performance clearly exceeds the performance levels described as "Very Good"			
4-Very Good	Contractor is in compliance with contract requirements and/or delivers quality product/service.	Contractor is effective in managing costs and submits current, accurate, and complete billings	Contractor is effective in meeting milestones and delivery schedule	Response to inquiries, technical/service/ administrative issues is effective
3-Satisfactory	Minor inefficiencies/errors have been identified	Contractor is usually effective in managing cost	Contractor is usually effective in meeting milestones and delivery schedules	Response to inquires technical/ service/administrative issues is somewhat effective
2-Marginal	Major problems have been encountered	Contractor is having major difficulty managing cost effectively	Contractor is having major difficulty meeting milestones and delivery schedule	Response to inquiries, technical/service/administrative issues is marginally effective
1-Unsatisfactory	Contractor is not in compliance and is jeopardizing achievement of contract objectives	Contractor is unable to manage costs effectively	Contractor delays are jeopardizing performance of contract objectives	Response to inquiries, technical/service/administrative issues is not effective

1. Rate Contractors quality of workmanship, management of sub contractor performance, project cleanliness, organization and safety requirement.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

2. Rate Contractor administration of project costs, change orders and financial management of the project budget.	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

3. Rate Contractor's performance and adherence to Project Schedule, delay procedures and requirements of substantial completion, inspection and punch-list performance.	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

4. Evaluate performance of contractor management team including project manager, engineer and superintendent also include in the rating team's ability to work well with owner, user agency and consultants.	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

5. Rate success of Contractor's management plan, completion of the plans mitigation of project risks and performance of value engineering concepts.	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

Signed by:	Date:	Mean Score

Additional Comments:

CONSTRUCTION SPECIFICATION

SPECIAL CONDITIONS

1. **SCOPE**

This section of the specifications cover specific requirements, instructions, and conditions applicable to this project only, which are not covered by the General Conditions or detailed specifications. Should there be conflicting statements between this section and other sections of these specifications, this section shall govern.

2. **STANDARD PRODUCTS**

The material brand names and catalog numbers shown on the drawings or called out in the specifications are meant to set a standard that all other materials should meet. The Contractor or supplier will submit information and data to show his material is equal. The decision of the Engineer shall be final in this section.

3. **MAINTENANCE OF TRAFFIC**

The Contractor shall at all times conduct his operations so that there is a minimum of interruptions of the parking lot.

4. **CONTRACTOR TO MAINTAIN AND REPLACE STAKES**

The Contractor shall furnish without charge, competent men from his force, stakes, tools, and other materials, for the proper staking out of the work, in making measurements and surveys, and in establishing temporary or permanent reference marks in connection with the work. This does not mean to imply, the Contractor is to pay for initial staking, as this will be the cost of the Owner.

Initial staking to be provided by the Owner will be the establishment of:

a. Bench Marks.

b. Original lines and grades necessary for horizontal and vertical control of the construction of the permanent works.

c. Right-of-way limits.

The Contractor shall provide surveys necessary to maintain the lines and grades during

the construction of the permanent works.

5. **LINES AND GRADES**

All work done under this contract shall be done to the line, grades, and elevations shown on the plans, or as directed by the Engineer. The Contractor shall keep the Engineer informed, a reasonable time in advance, of the times and places at which he intends to do work, in order that lines and grades may be furnished and necessary measurements for record and payment may be made with the minimum of inconvenience to the Engineer and delay to the Contractor.

6. **PAYMENT OF SUPPLIES AND SUBCONTRACTORS**

It is intended that the Contractor and subcontractor make full monthly payments to their suppliers and subcontractors as invoices are rendered. Such invoices shall be deemed as paid at the time each monthly certificate of payment is prepared by the Engineer. Affidavits will be submitted by the Contractor as means of certifying to the Engineer that all equipment and materials delivered have been paid for. This will be the normal proof of payment; however, the Engineer will have the right at any time to demand copies of certified paid invoices. Failure or inability to provide such paid invoices will be sufficient cause for hold-up of further monthly pay estimates.

7. **CERTIFICATIONS**

Certifications that all materials used in the construction of the permanent works meet these specifications will be required. These certifications shall include the contract number, project name, bid item number, material furnished, applicable specification number and quantity furnished.

8. **TEST**

Test results that are required form the Contractor at the Contractor's expense will be performed as specified in the specifications. Duplicate copies of the test results shall be furnished to the Engineer for his approval at least 10 days prior to the use of the materials in the permanent works. All "on site" testing shall be made in the presence of and be approved by the Engineer or his representative. Written test results for "on site" tests will not be required.

9. **EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL CONDITIONS, AND SITES**

The bidder is required to carefully examine the site of the proposed work, the proposal, plans, specifications, supplemental specification, special provision, and contract forms before submitting a proposal.

The submission of a bid shall be considered PRIMA FACIE evidence that the Bidder has made the required examinations and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the contract.

10. **IMPROVEMENT RESTORATION**

All improvements damaged as a result of Contractor's work shall be replaced by the Contractor. Improvement restoration shall be completed immediately upon completion of work in that area.

11. **OVERTIME WORK**

The Contractor shall not work Saturdays, Sundays or holidays.

12. **WASTE MATERIAL**

The Contractor shall be responsible for disposal of waste and debris from the site.

13. **SUPERVISION BY CONTRACTOR**

The Contractor will supervise and direct work. He will be solely responsible for the means, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the work site a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the contractors representative at the site. The supervisor or superintendent shall have full authority to act on behalf of the contractor and all communications given to the supervisor shall be as binding as if given to the contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

14. **CONTRACTOR'S PERSONNEL**

All work under this contract shall be performed in a skillful and workmanlike manner. The Owner may, in writing, require the Contractor to remove from work any employee the Owner deems incompetent, careless, or otherwise objectionable.

15. **GUARANTEE OF THE WORK**

The Contractor shall, for a period of two (2) years after completion and acceptance of the work, maintain and repair any defective work which may occur to the permanent work. If the Contractor fails to correct defective work, Owner will notify the bonding company of Contractor's failure to respond.

16. **LIABILITY INSURANCE**

Before the contract is executed the Contractor with the successful bid shall be required to furnish to Owner, a copy of the public liability and property damage insurance policy in an amount of no less than $1,000,000 each occurrence, which is to be in force and applicable to the project. In addition, the Contractor shall be required to furnish, a letter from the company holding said policy, stating that the Owner will be informed of any change in the status of the policy. Also, Workmen's Compensation Insurance shall be provided by the Contractor.

17. **WEEKEND WORK / INCLEMENT WEATHER**

Weekends (Saturday or Sunday) and Holidays that have inclement weather will not be used for time extension unless the Contractor has received prior written permission from the Engineer to work. Days on which the Contractor is prevented, by inclement weather, or conditions determined by the Engineer, to be adverse too proceed, the time for completion will be extended by the amount of days delayed.

18. **COMPENSATION**

Compensation for compliance to these Special Conditions will be made in the appropriate bid items.

CONSTRUCTION SPECIFICATION

8. MOBILIZATION

1. SCOPE

The work shall consist of mobilization of the Contractor's forces and equipment necessary for performing the work required under the contract.

It shall include the purchase of contract bonds, insurances, transportation of the personnel, equipment, and operating supplies to the site; establishing of office, buildings, construction signing in accordance with the manual on "Uniform Traffic Control Device", and other necessary facilities at the site; and other preparatory work at the site.

It shall not include mobilization for any specific time of work for which payment for mobilization is provided elsewhere in the contract.

This specification covers mobilization of work required by the contract at the time of award. If additional mobilization costs are incurred during performance of the contract as a result of change or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the items of work changed or added.

2. PAYMENT

Payment will be made as the work proceeds, after presentation of invoices by the contractor showing his own mobilizations costs and evidence of the charges of suppliers, subcontractors, and others for mobilization work performed by them. If the total of such payments is less than the contract lump sum for mobilization, the unpaid balance will be included in the final contract payment. Total payment will be the lump sum contract price for mobilization, regardless of actual cost to the Contractor.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated into the project, or the purchase costs of operating supplies.

Payment of the lump sum contract price for mobilization will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to completion of the work.
Compensation for any item of work described in the contract but not listed on the bid

schedule will be included in the payment for the item or work to which it is made subsidiary. Such items and the items to which they are made subsidiary in Section 3 of this specification.

3. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 1- Mobilization

1. This item shall consist of the contract bonds, construction signing, and mobilization of the Contractor's forces and equipment, as defined in Section 1, required for performing the work under this contract.

2. Payment will be made in accordance with Section 2.

CONSTRUCTION SPECIFICATIONS

10. BITUMINOUS SURFACE COURSE

1. SCOPE

The work shall consist of the construction of a surface course composed of mineral aggregate and bituminous binder, placed and compacted within the lines and grades shown on the plans.

2. MATERIALS

a. Asphaltic Cements: Viscosity grades of asphalt cement prepared from petroleum shall conform to the requirements of AASHTO Designation M-226.

b. Asphaltic Emulsions: Anionic emulsified asphalt shall conform to the requirements of AASHTO Designation M-140.

c. Mineral Aggregate: Mineral aggregate shall consist of crusher processed virgin aggregate material consisting of crushed stone, and gravel, conforming to the following requirements:

1. Course aggregate retained on the No. 4 sieve shall consist of clean, hard, tough, durable, and sound fragments, with not more than 3 percent by weight of flat, elongated, soft or disintegrated particles, and shall be free from vegetable matter or other deleterious substances.

2. That portion of the aggregate retained as the No. 4 sieve shall have not less than 50% of particles by weight with at least two mechanically fractured face, or clean angular face.

3. The aggregate shall have a percentage of wear not exceeding 50% for road mix and 40% for plant mix, when tested in accordance with AASHTO Designation T-96. The Contractor shall certify that the mineral aggregate used on the job shall meet this wear test prior to its placement in the surface course.

4. Fine aggregate passing the No. 4 sieve, may be either a natural or manufactured product. The aggregate shall be clean, hard-grained and moderately sharp, and shall contain not more than 2 percent by weight of vegetable matter or other deleterious substances.

5. That portion of the fine aggregate passing the No. 40 sieve shall be

nonplastic when tested in accordance with AASHTO Designation T-90.

6. The weight of minus 200 mesh sieve material retained in the aggregate as determined by the difference in percent passing a No. 200 sieve by washing and dry sieving without washing shall not exceed 6 percent of the total sample weight.

7. The combined mineral aggregate plus any specified additives, when mixed with the specified bituminous binder in accordance with ASTM Designation D-1559, shall conform to the following requirements:

   Marshall Stability.....1200-2500 lbs.
   Flow (0.01 inch).....10-18
   Voids content.....1.5% to 3.0%

   The requirements specified in this subsection shall be used to determine the suitability of the aggregate sources.

8. The combined dry mineral aggregate shall be uniformly graded and of such size that it meets one of the following gradation bands:

   ½" Gradation

	Ideal Gradation of Passing Band	% Passing Gradation Band
½"	100	100
#4	70	60-80
#16	35	28-42
#50	17	11-23
#200	7	5-9

   Any deviation from the above gradation Bands must be approved in writing by the Engineer.

9. Contractor will be required to supply the Engineer with a job mix formula based on the proceeding criteria. Job mix formula must be approved by the Engineer

3. CONSTRUCTION METHODS

a. Hot Mix Plant: The mineral aggregate and bituminous binder shall be mixed at a central mixing plant. The shortest mixing time consistent with satisfactory coating of the aggregate shall be used, as determined by the Engineer. The mineral aggregate shall be considered satisfactorily coated with bitumen when all of the particles passing the No. 4 sieve and 98 percent of the particles retained on the No.4 sieve are coated.

b. Spreading and Compaction: Place asphalt concrete pavement of 3-inches or more, in total compacted thickness, in two equal courses. The mixture shall be spread and struck-off in such a manner that finished surface shall conform to the elevations, grades, and cross-sections shown on the drawings or as staked in the field.

After the mixture has been spread, the surface shall be longitudinally rolled, beginning at the outside edge or lower side and proceeding toward the high side. Each pass of one roller shall overlap the proceeding pass by at least one-half the width of the roller. The surface shall be rolled by 4 passes with a pneumatic or steel-wheel exerting a minimum pressure of 40 psi., or by an approved equal method. Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller.

c. Finishing: The surface shall be finished to a smooth, uniform line and grade with surface deviations not exceeding 3/8-inch in 10 feet. Determination of compliance with smoothness may be made with a straight edge, chalk-line, or profilograph at the option of the Engineer. Any irregularities shall be satisfactorily corrected at the expense of the Contractor.

d. Temperature Control: The minimum temperature of the bituminous material at the time of application shall be 250 degrees Fahrenheit.

e. Weather Limitations: Bituminous material shall not be placed when weather conditions are unfavorable or when the air temperature in the shade is less than 50 degrees Fahrenheit.

f. Weight Devices: When the method of measurement is by weight, the Contractor shall provide weigh scales, at the job site. Scales will be certified by the Department of Agriculture.

The scales shall be accurate to within 1 percent of the correct weight throughout the range of use. Before using the scales and as frequently thereafter as the Engineer determines necessary to insure accuracy, the Contractor shall have the scales checked, adjusted, and certified by a representative of the State agency. The Contractor shall maintain the scales to the required accuracy.

g. Sampling of Aggregate: The Contractor shall submit test results and a certification of compliance that states that the gradation of the aggregate meets the contract requirements. The Contractor shall equip crushing, screening, and mixing plants with sampling devices. The Contractor shall take additional samples of material for testing as directed by the Engineer. These samples may be required at any time to validate the certification furnished by the Contractor.

Provisions shall be made for accurate proportioning. Each compartment shall have an outlet feed that can be shut off completely when any bin becomes empty. The bins or aggregate feeding system shall be constructed so samples can be readily obtained.

Positive weight measurement of the combined cold feed shall be maintained to allow regulation of the feed gate and permit automatic correction for variations in load.

The bitumen feed control shall be coupled with the total aggregate weight measurement device to automatically vary the bitumen feed rate and to maintain the required proportion. Means shall be provided for checking the quantity or rate of flow of bitumen into the mixing unit. Thermometers shall be fixed in the bitumen feed line at the charging valve of the mixer unit and at the discharge chute of the mixer unit. The Engineer may require replacement of any thermometer by an approved temperature-recording apparatus to allow better regulation of the material temperature.

A method shall be provided to automatically adjust the bituminous content in the mix for moisture variations in the cold feed.

h. Hauling Equipment: Trucks used for hauling bituminous mixtures shall have tight, clean, smooth metal beds that have been thinly coated with a material to prevent the moisture from adhering to the beds. Truck beds shall be drained prior to loading. Each truck shall have a cover to protect the mixture from the weather. When necessary to insure that the mixture will be delivered at the specified temperature, truck beds shall be insulated and covers shall be securely fastened.

I. Bituminous Pavers: Bituminous pavers shall be self-contained, power-propelled units, provided with an adjustable activated-screed or strike-off assembly heated, if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths and thicknesses shown on the drawings. When shown on the drawings, pavers shall be equipped with a control system capable of automatically maintaining the proper screed elevation. The control system shall be automatically actuated from either a reference line or surface through a system of sensors that will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface.

The transverse slope control system shall be capable of being made inoperative so that the screed can be controlled by mechanisms that will independently control the elevation of each end of the screed from reference line or surfaces.

The controls shall be capable of working in conjunction with any of the following attachments:

1. Ski-type device of not less than 40 feet in length.

2. Taut stringline (wire) set to grade.

3. Short ski or shoe.

j. Compaction shall be performed with either vibratory steel-wheel or steel-wheel and pneumatic-tire rollers.

Rolling shall begin at the sides and proceed longitudinally parallel to the road centerline, each trip overlapping one-half the roller width, gradually progressing to the center. When paving in echelons or abutting a previously placed land, the longitudinal joint shall be rolled first, then followed by the above rolling procedure. On superelevated curves the rolling shall begin at the low side and progress to the high side.

Along forms, curbs, header walls, and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons, or mechanical tampers.

k. Joints, trimming edges, and cleanup: Placing of the bituminous mixture shall be continuous. Rollers shall not pass over the unprotected end of a freshly laid mixture. Transverse joints shall be formed by cutting back into the previous run to expose the full depth of the course. Heat shall be applied to contact surfaces or transverse joints just before any additional mixture is placed against the previously rolled material.

4. FLUSH COAT

When required, the coat shall be placed on the completed surface course. The coat shall not be placed within 7 days after the surface course is laid. Prior to placing the coat, the existing surface shall be cleaned of all dirt, sand, dust, or other objectionable material.

The material shall be sprayed over the prepared surface by means of a pressure distributor.

5. ACCEPTANCE SAMPLING AND TESTING

a. Finished work samples. When required by the Engineer, the Contractor shall cut samples from the pavement. Samples size and locations will be designated by the Engineer. Samples shall be neatly cut with a saw or core drill. Voids left by sampling shall be backfilled and compacted to the density of the surrounding material.

b. The Engineer will perform the testing of bituminous mixture (gradation and bituminous content). Acceptance samples of the mixture will be taken after it has been placed on the finished surface and just prior to compaction. Samples will be selected on a random basis and taken as frequently as the Engineer elects.

c. Acceptance and testing bituminous mixture (compaction). After the bituminous mixture has been placed and compacted, the pavement shall meet the following density requirements.

Percent of Relative Maximum Density From Job Mix Formula
93 min.

Samples and test will be taken as frequently and at such locations as the Engineer elects. Compaction testing will be done by the Engineer.

d. Acceptance sampling and testing of bituminous mixture (surface and thickness tolerance).

1. Surface. Acceptance testing will be performed on the top surface. The surface will be tested by the Engineer with a straightedge. The variation of the surface from the testing edge of the straightedge shall not deviate at any point more than 1/8-inch.

2. Thickness. The total compacted thickness of the mixture shall not vary more than 1/4-inch from the specified thickness. The compacted thickness shall not consistently be below nor consistently above the specified thickness. The Engineer reserves the right to test areas which appear defective and require immediate correction.

6. <u>Price Adjustments</u>

1. Gradation and Asphalt Content – See Table A. The computation of the adjusted unit price will be based upon the minimum pay factor determined from Table A.

   a. The Engineer may order the removal of the mix if the acceptance tests deviate from the job-mix formula for a particular sieve or sieves, or if the asphalt content is more than the values shown under the 0.70 pay factor for asphalt concrete in Table A.
   b. The pay factor for material allowed to remain will be 0.50 for asphalt concrete.
   c. A lot is the average of three tests taken in the same day and represents the number of square feet placed during each production day.

2. Density

   a. Areas with deficient density will be subject to the following price reductions:

TABLE A	**PAY FACTOR**
AVERAGE DENSITY IN PERCENT	**ASPHALT CONCRETE**
93 or more	1.00
91 to 92.9	0.90
Less than 91	0.50

TABLE A ACCEPTANCE SCHEDULE FOR GRADATION (Percentage Points)		
SIEVE SIZE	**PAY FACTOR A.C.**	**DEVIATIONS OF THE IDEAL GRADATION ACCEPTANCE TESTS FROM THE JOB-MIX (PERCENTAGE POINTS)**
Asphalt Content	1.00	0-0.38
	0.95	0.39-0.43
	0.90	0.44-0.47
	0.80	0.48-0.52
	0.70	0.53-0.56

½ inch & larger	1.00	0-1
	0.95	1.0-2.0
	0.90	2.0-3.0
	0.80	3.0-4.0
	0.70	4.0-5.0
No. 4	1.00	0-10
	0.95	10-11.4
	0.90	11.5-11.9
	0.80	11.9-12.5
	0.70	12.5-13.0
No. 16	1.00	0-7.0
	0.95	7.0-7.3
	0.90	7.4-7.7
	0.80	7.8-8.1
	0.70	8.2-8.4
No. 50	1.00	0-6.0
	0.95	6.0-6.5
	0.90	6.6-6.8
	0.80	6.9-7.1
	0.70	7.2-7.5
No. 200	1.00	0-2.0
	0.95	2.0-2.9
	0.90	3.0-3.1
	0.80	3.2-3.3
	0.70	3.4-3.5

7. MEASUREMENT AND PAYMENT

a. The bituminous material and mineral aggregate shall be measured by the square foot.

b. Tack coat is required on all seams and overlays and will be subsidiary to this Bid Item and not paid for separately.

c. Payment for the bituminous material, mineral aggregate will be made at the contract unit price. Such payment shall constitute full compensation for furnishing, mixing, spreading, the bituminous material and mineral aggregate, compacting all other items necessary and incidental to the performance of the work.

8. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and construction details are:

a. Bid Item 2, HMA (1/2-inch Mix) 2-inch Overlay

1. This item shall consist of furnishing the mineral aggregate, bituminous material, mixing the aggregate and bituminous material, spreading, and compacting the mixture as shown on the drawings.

2. Contractor will supply the Engineer with the mix calibration factor, and a set of calibration samples 7 days prior to placement of asphalt.

3. The aggregate shall meet the gradation requirements as listed in Section 2.C.8 of these specifications. The gradation of the aggregate shall be submitted in writing to the Engineer for his approval prior to the placing of the asphalt. The borrow area selected by the Contractor must meet the approval of the Engineer.

4. The asphalt shall be grade AC-10, viscosity graded.

5. The aggregates and the bituminous material shall be measured or gaged and introduced into the mixer in the amount specified by the job mix formula.

   After the required amounts of aggregate and bituminous material have been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of particles and a thorough distribution of the bituminous material throughout the aggregate is obtained.

6. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be placed and finished by hand tools.

7. Hot mixture shall be placed at a temperature not less than 250 degrees Fahrenheit.

8. Material trimmed from the edges and any other discarded bituminous mixture shall be removed from the runway and disposed of by the Contractor in an approved area.

9. Contractor will be required to hand rake all seams.

10. Testing noted in Section 5.a will not be required.

11. Asphalt shall be placed at the finished depth noted on the plans. Tack coat will be required on all asphalt edges.

12. Contractor will not stockpile hot asphalt on existing asphalt roads prior to placement.

13. Bituminous surface course will not be placed during rain, when the roadbed is wet or during other adverse weather conditions. The owner will not be responsible for any bituminous surface course that is on the project site, but unable to spread due to adverse weather.

14. Contractor will be required to deliver to the Engineer a weight invoice prior to placement of the asphalt surface course, invoices not received the day of placement will not be paid for.

15. Contractor will hand sweep and remove all sluffage on and against asphalt and concrete gutters just prior to bituminous surface course placement to assure a clean surface and proper depth.

16. Measurement and payment shall be in accordance with Section 7a and c for each type of asphalt concrete pavement actually placed.

b. Bid Item 3, HMA (1/2-inch Mix) 3-inches Thick

1. This item shall consist of furnishing the mineral aggregate, bituminous material, mixing the aggregate and bituminous material, spreading, and compacting the mixture as shown on the drawings.

2. Contractor will supply the Engineer with the mix calibration factor, and a set of calibration samples 7 days prior to placement of asphalt.

3. The aggregate shall meet the gradation requirements as listed in Section 2.C.8 of these specifications. The gradation of the aggregate shall be submitted in writing to the Engineer for his approval prior to the placing of the asphalt. The borrow area selected by the Contractor must meet the approval of the Engineer.

4. The asphalt shall be grade AC-10, viscosity graded.

5. The aggregates and the bituminous material shall be measured or gaged and introduced into the mixer in the amount specified by the job mix formula.

After the required amounts of aggregate and bituminous material have been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of particles and a thorough distribution of the bituminous material throughout the aggregate is obtained.

6. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be placed and finished by hand tools.

7. Hot mixture shall be placed at a temperature not less than 250 degrees Fahrenheit.

8. Material trimmed from the edges and any other discarded bituminous mixture shall be removed from the runway and disposed of by the Contractor in an approved area.

9. Contractor will be required to hand rake all seams.

10. Testing noted in Section 5.a will not be required.

11. Asphalt shall be placed at the finished depth noted on the plans. Tack coat will be required on all asphalt edges.

12. <u>Contractor will not stockpile hot asphalt on existing asphalt roads prior to placement.</u>

13. Bituminous surface course will not be placed during rain, when the roadbed is wet or during other adverse weather conditions. The owner will not be responsible for any bituminous surface course that is on the project site, but unable to spread due to adverse weather.

14. Contractor will be required to deliver to the Engineer a weight invoice prior to placement of the asphalt surface course, invoices not received the day of placement will not be paid for.

15. Contractor will hand sweep and remove all sluffage on and against asphalt and concrete gutters just prior to bituminous surface course placement to assure a clean surface and proper depth.

16. Measurement and payment shall be in accordance with Section 7a and c for each type of asphalt concrete pavement actually placed.

c. <u>Subsidiary, Pavement and Concrete Sawing</u>

1. This item shall consist of furnishing the equipment and labor required to saw cut the existing asphalt pavement and existing sidewalk as staked in the field.

3. Saw cut edges shall be required where existing bituminous surface and new bituminous surface join. The edge shall be clean, vertical and full depth of bituminous surface. Cutting the edge shall be made just prior to placing new bituminous pavement. A tack coat will be applied to the edge prior to placing new bituminous pavement.

3. A diamond saw shall be required to make a vertical cut through the full depth of the asphalt surfacing and concrete sidewalk.

4. Traffic or construction equipment shall not be allowed to cross the saw cut edge. If sawed edges are broken due to construction equipment the damaged area will be recut at the Contractor's expense, Owner will not pay for recutting of damaged areas.

5. Measurement will not be made. Compensation for meeting this specification will be made part of the payment for Bid Items which require sawcutting.

d. <u>Bid Item 4, Paving Fabric (Petromat)</u>

1. This item shall consist of furnishing and placing a geotextile (paving fabric) beneath a pavement overlay to provide a waterresistant membrane and crack-retarding layer.

2. Paving Fabric: The paving fabric will be a Petromat Style 4598 fiber, needle-punched, nonwoven material consisting of at least 85 percent by weight polyolefins, polyesters or polyamides. The paving fabric shall be resistant to chemical attack, rot and mildew and shall have no tears or defects that will adversely alter its physical properties. The fabric shall be specifically designed for pavement applications and be heat-set on one side to reduce bleed-through of tack coat and to minimize fabric pick-up by construction equipment during installation. The fabric shall meet the physical requirements specified in Table 1.

3. The tack coat used to impregnate the fabric and bond the fabric to the pavement shall be the same grade asphalt cement as used in the hot mix asphalt concrete. A cationic or anionic emulsion may be used as approved by the Engineer. The Contractor shall follow the recommendations of the paving fabric manufacturer when an asphalt

emulsion is used. The use of cutbacks or emulsions that contain solvents shall not be permitted.

4. The paving fabric shall be kept dry and wrapped such that it is protected from the elements during shipping and storage. If stored outdoors, the fabric shall be elevated and protected with a waterproof cover. The paving fabric shall be labeled in accordance with ASTM D 4873-88, "Standard Guide for Identification, Storage, and Handling of Geotextiles."

5. The air and pavement temperatures shall be at least 50°F (10° C) and rising for placement of asphalt cement and shall be at least 60°F (16° C) and rising for placement of asphalt emulsion. Neither asphalt tack coat nor paving fabric shall be placed when weather conditions are not suitable, in the opinion of the Engineer.

6. The pavement surface shall be dry and be thoroughly cleaned of all dirt and oil to the satisfaction of the Engineer. Cracks 1/8" wide or greater shall be cleaned and filled with suitable bituminous material or by a method approved by the Engineer. Crackfilling material shall be allowed to cure prior to placement of paving fabric. Potholes and other pavement distress shall be repaired. Repairs shall be performed as directed by the Engineer. The paving fabric must be placed on a drainable grade with no depressions which may hold water in the overlying asphalt concrete.

7. The tack coat shall be applied using a calibrated distributor truck spray bar. Hand spraying, squeegee and brush application may be used in locations where the distributor truck cannot reach. Every effort shall be made to keep hand spraying to a minimum.

8. The tack coat shall be applied uniformly to the prepared, clean, dry pavement surface. The tack coat application rate must be sufficient to saturate the fabric and to bond the fabric to the existing pavement surface. The tack coat application rate shall be 0.22 to 0.30 gallons per square yard as required by the roadway surface and environmental conditions. When using emulsions, the application rate must be increased as directed by the Engineer to offset the water content of the emulsion. Within street intersections, on steep grades or in other zones where vehicle speed changes are common, the normal application rate shall be reduced by about 20 percent as directed by the Engineer, but to not less than 0.20 gallons per square yard. The temperature of the tack coat shall be sufficiently high to permit a uniform spray pattern. For asphalt cements, the minimum temperature shall be 290°F. To avoid damage to the fabric, distributor tank temperatures shall not exceed 325°F. For asphalt emulsions, the distributor tank temperatures shall be maintained between 130°F and 160°F. The target width of the tack coat application

shall be equal to the paving fabric width plus 6”. Tack coat application shall be wide enough to cover the entire width of fabric overlaps. The tack coat shall be applied only as far in advance of paving fabric installation as is appropriate to ensure a tacky surface at the time of paving fabric placement. Traffic shall not be allowed on the tack coat. Excess tack coat shall be cleaned from the pavement.

9. The paving fabric shall be placed onto the tack coat using mechanical or manual laydown equipment capable of providing a smooth installation with a minimum amount of wrinkling or folding. The paving fabric shall be placed before the asphalt cement tack coat cools and loses its tackiness. Paving fabric shall not be installed in areas where the overlay asphalt tapers to a minimum compacted thickness of less than 1.5”. When asphalt emulsions are used, the emulsion shall be allowed to cure properly such that essentially no water moisture remains prior to placing the paving fabric. Fabric wrinkles severe enough to cause folds shall be slit and laid flat. Brooming and/or rubber-tire rolling will be required to maximize paving fabric contact with the pavement surface. Additional hand-placed tack coat may be required at overlaps and repairs as required by the Engineer. Turning of the paver and other vehicles shall be done gradually and kept to a minimum to avoid movement and damage to the paving fabric. Abrupt starts and stops shall also be avoided. Damaged fabric shall be removed and replaced with the same type of fabric and a tack coat.

10. At joints, fabric rolls shall overlap by 1”to 3”. End joints and joints from repair of wrinkles should be made to overlap or “shingle” in the direction that the pavement overlay will be placed. Overlaps of adjacent rolls may be as great as 6” to accommodate variations between the width of the roadway and the paving fabric. Excess fabric shall be cut and removed to ensure that overlaps of adjacent rolls do not exceed 6”. A uniform application of tack coat shall be applied between all fabric overlaps. Any locations that do not have tack between the overlaps shall be corrected by manual placement of tack coat prior to overlay construction. Unless otherwise approved by the Engineer, no traffic except <u>necessary</u> construction traffic will be allowed to drive on the paving fabric.

    All areas with paving fabric placed will be paved the same day. No traffic except necessary construction traffic will be allowed to drive on the paving fabric.

11. Asphalt overlay construction shall closely follow fabric placement. All areas in which paving fabric has been placed will be paved during the same day. Excess tack coat that bleeds through the paving fabric shall be removed. Excess tack coat can be removed by broadcasting hot mix or sand on the paving fabric. Excess sand or hot mix should be removed before beginning the paving operation. In the event of rainfall on the paving fabric prior to the

placement of the asphalt overlay, the paving fabric must be allowed to dry completely before asphalt is placed. Overlay asphalt thickness shall meet the requirements of the contract drawings and documents. The minimum compacted thickness of overlay asphalt shall not be less than 1.5” in areas of paving fabric installation.

12. The paving fabric will be measured by the Square Yard.
Tack coat will not be measured. Tack coat will be subsidiary to paving fabric.

13. Payment, the accepted quantities of paving fabric will be paid for at the contract unit price. Such payment will constitute full compensation or all labor, materials, equipment, transportation, tools, and all other items necessary or incidental to the completion of this item.

e. Bid Item 5, Remove Asphalt

1. This item shall consist of removing the asphalt as shown on the drawings or as directed by the engineer.

2. Measurement will be by the square foot of asphalt removed.

3. Payment will be at the contract unit price. Such payment will constitute full compensation for labor, equipment, and all others items necessary and incidental to the performance of the work.

CONSTRUCTION SPECIFICATION

11. Asphalt Pavement Crack Sealing

1. **SCOPE**
The work shall consist of cleaning and sealing cracks in the existing pavement.

2. **MATERIALS:**
   a. Crack Sealing Compound CMC #115 or equal blend of materials to produce a material meeting CMC #115 specifications.

3. **CONSTRUCTION REQUIREMENTS:**

   a. Clean and seal visible thermal cracking six-feet or more between cracks or as directed by the Engineer.

      1. Remove foreign matter and loosened particles with an HCA (hot compressed air) heat lance for at least six inches on both sides of the crack immediately prior to sealing.
      2. Adequate cleaning is determined by a darkening of the surface at least two inches in width, centered on the crack.
      3. Clean crack to a depth of two inches or to the bottom of the crack, whichever is greater.
      4. Where dirt is still being retained on the unmelted (undarkened) surface the darkened width may be expended to match the sealant configuration or as directed by the Engineer.

   b. The heat lance shall meet the following requirements:

      1. Temperature of heated air at exit orifice minimum of 2,800 D.F.
      2. Velocity of exiting heated air minimum of 2,800 fps.
      3. Direct flame dryers shall not be used.

   c. The crack shall be overfilled and immediately squeegeed to form a band-aid.

      1. Attach squeegee to the wand or keep within five feet of the sealant applicator at all times.

   d. The band shall have the following configuration:

      1. Band extending a maximum of one inch on either side of the crack(s).
      2. Maximum width of band shall be two inches.

3. Band shall have a maximum thickness of 1/16 inch. At least 90% of band placed shall have a thickness of 1/16 inch ±1/64 inch.
4. Center band on crack.

e. Where traffic or construction activities may cause tracking or pullout of sealant material, the Contractor shall sand the sealant as it is placed or as directed by the Engineer.

f. Cracks in excess of one inch in width shall be filled with one-half minus plant mix or road mix or as directed by the Engineer.

g. Sealant material pickup-up or pulled-out shall be replaced at Contractor's expense. Any damage to the traveling public resulting from sealant application or sealant pullout shall be paid for by the Contractor.

h. Clean and seal across the full width of the bituminous surfacing including side slopes or as directed by the Engineer.

I. Seal cracks when clean and dry and only upon inspection and approval by the Engineer.

j. Equipment: Use circulating hot oil heat transfer for heating the product (sealant machines). Direct heat transfer units (tar pots) shall not be used. Product tank capacity of sealant placement equipment not to exceed 500 gallons. Alternate equipment must be approved by the Engineer.

k. Temperature Control: Observe sealant manufacturers's temperature application instructions. Contractor's sealant unit shall have available at all times an operating ASTM-11-F thermometer with an intact memory column or a certified, calibrated digital pyrometer, electronic thermometer, or equivalent direct reading temperature measurement device capable of reading within ± 50DF from 200DF to 600DF

1. Product tank temperatures shall be recorded at one hour ±10 minutes intervals, and kept available for inspection by the Engineer. Product tank temperatures shall be taken with one of the certified calibrated devices described. Temperature gauge readings are not acceptable.

2. Material overheated in excess of 30DF above the manufacturer's recommended maximum temperature for one hour or 60DF for one-half hour shall be wasted at the Contractor's expense. Do not place material if the temperature is below the manufacturer's recommended minimum application temperature.

3. The Contractor's procedures for loading material into the product tank shall not depress the sealant temperature at the wand tip below manufacturer's

recommended application temperature.

4. MEASUREMENT AND PAYMENT

a. The completed and accepted quantities of this item shall be paid for at the contract unit price Lump Sum of 'Crack Sealing'. This shall include all specialized equipment, specialized materials, labor, tools, and other incidentals necessary to complete the work, including brooming, and sealing.

5. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and construction details are:

a. Bid Item 6, Crack Seal

1. This item shall consist of furnishing, transporting, and applying the crack sealing compound.

2. Measurement will be made by the Linear Foot. Payment will be at the contract unit price. Such payment shall constitute full compensation for the crack sealing, including all labor, materials, equipment and all other items necessary or incidental to the completion of the work.

CONSTRUCTION SPECIFICATION

13. ROTOMILLING

1. SCOPE:

The work shall consist of the rotomilling the existing asphalt as shown on the drawings and as required by the specifications.

A. Mill the existing bituminous surface at the location and to the depth specified in the plans.

2. MATERIALS:

A. Dispose of all material at an approved disposal area.

3. EQUIPMENT:

A. Use power-operated track propelled planing machine or grinder:
   1. Capable of milling to plan cross slope.
   2. Self-propelled with sufficient power, traction, and stability to maintain accurate depth of cut.
   3. Maximum of 5/8-inch between the cutting teeth on the mandrel.

B. Use appropriate cleaning equipment capable of sweeping and picking up millings to clean up after milling operation.

4. PROCEDURE:

A. Rotomill existing bituminous pavement surface to the width and depth shown on the plans to an accuracy of ± 3/8-inch of plan depth, measured from original surface to the top of the ridge.
   1. Maintain depth tolerance. Do not use skis or other profile grade control devices if the specified depth tolerance cannot be met with their use.

B. Rotomill the area as shown on the drawings.

4. CLEANING AND REPAIR:

A. Remove and clean all millings from the surface daily. Control dust created by the cutting action. Clean rotomilled surface after milling operation and prior to opening to traffic.

B. Remove and replace, or repair damage caused by the Contractor's operation outside of the widths and depths shown in the plans. Repair at Contractor's expense.

C. Dispose of the milled material in a manner approved by the Engineer.

5. ITEMS OF WORK AND CONSTRUCTION DETAILS:

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 7, Rotomill

1. This work shall consist of rotomilling the existing asphalt as shown on the drawings or staked in the field.

2. Measurement will be by the square foot.

3. Payment will be made at the contract unit price. Such payment will constitute full compensation for rotomilling the asphalt along with labor, material, equipment, and all other items necessary and incidental to the performance of the work.

CONSTRUCTION SPECIFICATION

21. EXCAVATION

1. SCOPE

The work shall consist of the excavation required by determining the specification and disposal of the excavated materials.

2. CLASSIFICATION

Excavation will be classified its common excavation for rock excavation in accordance with the following definitions were will be designated as a classified.

Common excavation shall be defined as the excavation of all materials that can be excavated, transported, and unloaded by the use of heavy ripping equipment and wheel tractor-scrapers with pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by means of excavators having a rated capacity of one cubic yard and equipped with attachments (such as shovel, bucket, back hoe, drag line or clam shell) appropriate to the character of the materials and the site conditions.

Rock excavation shall be defined as the excavation of all head, compacted or cemented materials the accomplishment of which requires blasting or the use of excavators larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than one cubic yard in volume encountered in materials other wise conforming to the definition of common excavation shall be classified as rock excavation.

Excavation will be classified according to the definitions by the engineer, based on his judgment of the character of the material and the site conditions.

The presence of isolated boulders or rock fragments larger than one cubic yard in size will not in itself be sufficient cause to change the classification of the surrounding material.

For the purpose of this classification, the following definitions shall apply:

Heavy ripping equipment shall be defined as a rear mounted, heavy duty, single tooth, ripping attachment mounted on a tractor having a power rating of 200-300 net horsepower (at the flight wheel).

Wheel tractor-scraper shall be defined as a self-loading (not elevating) and unloading scraper having a struck bowl capacity of 12-20 yards.

Pusher tractor shall be defined as a track type tractor having a power rating of 200-300 net horsepower (at the flywheel) equipped with appropriate attachments.

3. UNCLASSIFIED EXCAVATION

Items designated as "Unclassified Excavation" shall include all materials encountered regardless of their nature or the manner in which they are removed. When excavation is unclassified, none of the definitions or classifications stated in Section 12 of this specification shall apply.

4. BLASTING

The transportation, hauling, storage, and use of dynamite and other explosives shall be directed and supervised by a person of proven experience and ability in blasting operations.

5. USE OF EXCAVATED MATERIALS

Method 1

To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent earth fill or rock fill. The suitability of materials for specific purposes will be determined by the Engineer. The Contractor shall not waste or otherwise dispose of suitable excavated materials.

Method 2

Suitable materials from the specified excavations may be used in the construction of required earth fill or rock fill. The suitability of materials for specific purposes will be determined by the Engineer.

6. DISPOSAL OF WASTE MATERIALS

Method 1

All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of at the location shown on the drawings.

Method 2

All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of by the Contractor at sites of his own choosing away from the site of the work.

7. BRACING AND SHORING

Excavated surfaces too steep to be safe and stable if unsupported shall be supported as necessary to safeguard the work and workmen, to prevent sliding or settling of the adjacent ground, and to avoid damaging existing improvements. The width o f the excavation shall

be increased if necessary space for sheeting, bracing, shoring, and other supporting installations. The Contractor shall furnish place and subsequently remove such supporting installations.

8. STRUCTURE AND TRENCH EXCAVATION

Structure or trench excavation shall be completed to the specified elevations and to sufficient length and width to include allowance for forms, bracing and supports, as necessary, before any concrete or earth fill is placed or any piles are driven within the limits of the excavation.

9. BORROW EXCAVATION

When the quantities or suitable materials obtained from specified excavations are insufficient to construct the specified fills, additional materials shall be obtained from the designated borrow areas. The extent and depth of borrow pits within the limits of the designated borrow areas shall be as directed by the Engineer.

Borrow pits shall be excavated and finally dressed in a manner to eliminate steep or unstable side slopes or other hazardous or unsightly conditions.

10. OVER EXCAVATION

Excavation in rock beyond the specified lines and grades shall be corrected by filling the resulting voids with portland cement concrete made of materials and mix proportions approved by the Engineer. Concrete that will be exposed to the atmosphere when construction is completed shall contain not less than 6 bags of cement per cubic yard of concrete. The concrete shall be placed and cured as specified by the Engineer. Over excavation in other material shall be backfilled and fine graded with granular material having less than 15% fines.

11. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, the volume of each type and class of excavation within the specified pay limits will be measured and computed to the nearest cubic yard by the method of average cross-sectional end areas. Regardless of quantities excavated, the measurement for payment will be made to the specified lines and grades directed by the Engineer to remove unsuitable material will be included, but only the extent the unsuitable conditions is not the result of the Contractor's operations.

Method 1

The pay limits shall be as designated on the drawings.

Method 2

The pay limits shall be defined as follows:

1. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavations is performed within areas designated for previous excavation or fill the upper limit shall be modified ground surface resulting from the specified previous excavation or fill.
2. The lower and lateral limits shall be the neat lines and grades shown on the drawings.

Method 3

The pay limits shall be defined as follows:

1. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavations is performed within areas designated for previous excavation or fill the upper limit shall be modified ground surface resulting from the specified previous excavation or fill.
2. The lower and lateral limits shall be the true surface of the completed excavation as authorized by the Engineer.

Method 4

The pay limits shall be defined as follows:

1. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavations is performed within areas designated for previous excavation or fill the upper limit shall be modified ground surface resulting from the specified previous excavation or fill.
2. The lower limit shall be at the bottom surface of the proposed structure.
3. The lateral limits shall be 18-inches out side of the outside surfaces of the proposed structure or shall be vertical planes 18-inches outside of and parallel to the footings, whichever gives the larger pay quantity, except as provided in d, below.
4. For trapezoidal channel linings or similar structures th at are to be supported upon the sides of the excavation without intervening forms, the lateral limits shall be at the under side of the proposed lining or structure.
5. For the purpose of the definitions in b, c, and d, above, any specified bedding or drain fill directly beneath or beside the structure will be considered to be part of the structure.

12. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in accordance with this specification and the construction details thereof are as follows:

a. Bid Item 8, Excavation

1. This work shall consist of excavation necessary for the construction of the permanent works in accordance with the specifications and plans or as directed by the Engineer. The work shall include transporting and disposing of excavated material.

2. The excavation for the permanent works shall be finished to the lines, grades, and typical sections shown on the plans or as directed. Excavation operations shall be conducted so that material outside of the limits will not be disturbed, unless otherwise directed.

3. Excavation areas shall be maintained in such conditions that the work shall be well drained at all times, including periods of work suspension.

4. Disposal of asphalt, concrete, and rubbish shall be by the Contractor, at an approved landfill capable of receiving such material.

5. Contractor will not use excavated material to construct the permanent works. All material will be disposed of by the Contractor. Disposal area must be approved by the Engineer.

6. Contractor will be required to replace any irrigation lines or sprinklers encountered during construction of the permanent works.

7. Measurement and Payment: Measurement will be by the square foot and payment will be at the contract unit price. Such payment will constitute full compensation for all excavation, labor, materials, equipment, and all other items necessary and incidental to the completion of the permanent works.

CONSTRUCTION SPECIFICATION

23. EARTH FILL

1. SCOPE

The work shall consist of the construction of earth embankments and other earth fills required by the drawings and specifications.

2. MATERIALS

All fill materials shall be obtained from required excavations and designated borrow areas. The selection, blending, routing and disposition of materials in the various fills shall be subject to approval by the Engineer.

Fill materials shall contain no sod, brush, roots or other perishable materials. Rock particles larger than the maximum size specified for each type of fill shall be removed prior to compaction of the fill.

The type of material used in the various fills shall be as listed and described in the specifications and drawings.

3. FOUNDATION PREPARATION

Foundations for earth fill shall be stripped to remove vegetation and other unsuitable materials or shall be excavated as specified.

Except as otherwise specified, earth foundation surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill or otherwise acceptably scored and loosened material shall be controlled as specified for the earth fill, and the surface materials of the foundation shall be compacted and bonded with the first layer of earth fill as specified for subsequent layers of earth fill.

Earth abutment surfaces shall be free of loose, uncompacted earth in excess of two inches in depth normal to the slope and shall be at such a moisture content that the earth fill can be compacted against them to effect a good bond between the fill and the abutments.

Rock foundation and abutment surfaces shall be cleared of all loose materials by hand or other effective means and shall be free of standing water when fill is placed upon them.

Occasional rock outcrops in earth foundations for earth fill, except in dams and other structures designed to restrain the movement of water, shall not require special treatment if they do not interfere with compaction of the foundation of initial layers of the fill or the bond between the foundation and the fill.

Foundation and abutment surfaces shall be not steeper than 1 horizontal to 1 vertical unless otherwise specified. Test pits or other cavities shall be filled with compacted earth fill conforming to the specifications for the earth fill to be placed upon foundation.

4. PLACEMENT

Fill shall not be placed until the required excavation and foundation preparation have been completed and the foundation has been inspected and approved by the Engineer. Fill shall not be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill.

Fill shall be placed in approximately horizontal layers, The thickness of each layer before compaction shall not exceed the maximum thickness specified. Materials placed by dumping in piles or windows shall be spread uniformly to no more than the specified thickness before being compacted. Hand compacted fill, including fill compacted by manually directed power tampers, shall be placed in layers whose thickness before compaction does not exceed 4-inches.

Adjacent to structures, fill shall be placed in a manner which will prevent damage to the structures and will allow the structures to assure the loads from the fill gradually and uniformly. The height of the fill adjacent to a structure shall be increased at approximately the same rate on all sides of the structure.

Earth fill in dams, levees and other structures designed to restrain the movement of water shall be placed so as to meet the following additional requirements:

a. The distribution of materials throughout each zone shall be essentially uniform, and the fill shall be free from lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material.

b. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed.

c. The top surface of embankments shall be maintained approximately level during construction, except that a crown of cross-slope of not less than 2 percent shall be maintained to insure effective drainage, and except as otherwise specified for drain fill zones. If the drawings or specifications require or the Engineer directs that the fill be placed at a higher level in one part of an embankment than another, the top surface of each part shall be maintained as specified above.

d. Dam embankments shall be constructed in continuous layers from abutment to abutment except where openings to facilitate construction or to allow the passage of

stream flow during construction is specifically authorized in the contract.

e. Embankment built at different levels as described under c or d above shall be constructed so that the slope of the bonding surfaces between embankment to be placed is not steeper than 3 feet horizontal to 1 foot vertical. The bonding surface of the embankment in place shall be stripped of all loose material, and shall be scarified, moistened and recompacted when the new fill is placed against it as needed to insure a good bond with the new fill and to obtain the specified moisture content and density in the junction of the place and new fill.

5. CONTROL OF MOISTURE CONTENT

During placement and compaction of fill, the moisture content of the materials being placed shall be maintained within the specified range.

The application of water to the fill materials shall be accomplished at the borrow areas insofar as practicable. Water may be applied by sprinkling the materials after placement on the fill, if necessary. Uniform moisture distribution shall be obtained by dicing, blending or other approved methods prior to compaction of the layer.

Material that is too wet when deposited on the fill shall either be removed or be dried to the specified content prior to compaction.

If the top surface of the preceding layer of compacted fill or a foundation or abutment surface in the zone of contact with the fill becomes too dry to permit suitable bond it shall be scarified and moistened by sprinkling to an acceptable moisture content prior to placement of the next layer of fill.

6. COMPACTION

Earth fill shall be compacted according to the following requirements for the class of compaction specified:

Class A compaction. Each layer of fill shall be compacted as necessary to make the density of the fill matrix not less than the minimum density specified. The fill matrix is defined as the portion of the fill material finer that the maximum particle size used in the compaction test method specified.

Class B compaction. Each layer of fill shall be compacted as to a mass density not less than the minimum density specified.

Class C compaction. Each layer of fill shall be compacted by the specified number of passes of the type and weight of roller or other equipment specified or by an approved equivalent method. Each pass shall consist of at least one passage of the roller wheel or

drum over the entire surface of the layer.

Fill adjacent to structures shall be compacted a density equivalent to that of the surrounding fill by means of hand tamping if permitted by the Contracting Officer, or manually directed power tampers or plate vibrators. Heavy equipment shall not be operated within 2 feet of any structure. Vibrating rollers shall not be operated within 5 feet of any structure. Compaction by means of drop weights operating from a crane or hoist will not be permitted.

The passage of heavy equipment will not be allowed: (1) over cast-in-place conduits prior to 14 days after placement of the concrete; (2) over cradled precast conduits prior to 7 days after placement of the concrete cradle, or (3) over any type of conduit until the backfill has been placed above the top surface of the structure to a height equal to one-half the clear span width of the structure or pipe or 2 feet, whichever is greater.

Compacting of fill adjacent to structures shall not be started until the concrete has attained the strength specified in Specification No. 32, Concrete, for this purpose.

The strength will be determined by compression testing of test cylinders cast by the Engineer for this purpose and cured at the work site in the manner specified in ASTM Method C 31 for determining when a structure may be put into service.

When the required strength of the concrete is not specified as described above, compaction of fill adjacent to structures shall not be started until the following time intervals have elapsed after placement of the concrete.

Structure	Time Interval
Retaining walls and counterforts	14 days
Walls backfilled on both sides simultaneously	7 days
Conduits and spillway risers, cast-in-place (with inside forms in place)	7 days
Conduits and spillway risers, cast-in-place (inside forms removed)	14 days

Structure	Time Interval
Conduits, precast & cradled	2 days

Conduits, precast & bedded	1 day
Antiseep collars and cantilever outlet bents	3 days

7. REMOVAL AND PLACEMENT OF DEFECTIVE FILL

Fill placed at densities lower than the specified minimum density or at moisture contents outside the specified acceptable range of moisture content or otherwise not conforming to the requirements of the specifications shall be reworked to meet the requirements or removed and replaced by acceptable fill. The replacement fill and the foundation, abutment and fill surfaces upon which it is placed shall conform to all requirements of this specification for foundation preparation, approval, placement, moisture control and compaction.

8. TESTING

During the course of the work, the Contractor will perform such tests as are required to identify materials, to determine compaction characteristics, to determine content, and to determine density of fill in place. These tests performed by the Contractor will be used to verify that the fills conform to the requirements of the specifications.

Densities of fill requiring Class A compaction will be determined by the Engineer in accordance with ASTM Method D 1556 (or by equivalent methods), except that the volume and moist weight of included rock particles larger than those used in the compaction test method specified for the type of fill will be determined and deducted from the volume and moist weight of the total sample prior to computation of density. The density so computed will be used to determine the percent compaction of the fill matrix.

9. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, the volume of each type and compaction class of earth fill within the specified zone boundaries and pay limits will be measured and computed to the nearest cubic yard by the method of average cross-sectional end areas. Unless otherwise specified, no deduction in volume will be made for embedded conduits and appurtenances.

The pay limits shall be as defined below, with the further provision that earth fill required to fill voids resulting from over-excavation of the foundation, outside specified lines and grades, will be included in the measurement for payment only where such over-excavation is directed by the Engineer to remove unsuitable material and where the unsuitable condition is not a result of the Contractor's operations.

(Method 1) The pay limits shall be as designated on the drawings.

(Method 2) The pay limits shall be the measured surface of the foundation when approved for placement of the fill and the specified neat lines of the fill surface.

(Method 3) The pay limits shall be the measured surface of the foundation when approved for placement of the fill and the measured surface of the completed fill.

(Method 4) The pay limits shall be the specified pay limits for excavation and the specified neat lines of the fill surface.

(Method 5) The pay limit shall be the specified pay limits for excavation and the measured surface of the completed fill.

(Use Method 6 or 7 with all Methods 1 through 5)

(Method 6) Payment for each type and compaction class of earth fill will be made at the contract unit price for that type and compaction class of fill. Such payment will constitute full compensation for all labor, materials, equipment and all other items necessary and incidental to the performance of the work.

(Method 7) Payment for each type and compaction class of earth fill will be made at the contract unit price for that type and compaction class of fill. Such payment will constitute full compensation for all labor, materials, equipment and all other items necessary and incidental to the performance of the work, except furnishing, transportation, and applying water to the foundation and fill materials.

Water applied to the foundation and fill materials will be measured and payment will be made as specified in Construction Specification.

(Use with All Methods) Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 10 of this specification.

10. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 9, Untreated Base Course

1. This work shall consist of providing, placing, watering, blading and compacting the untreated base course to the lines and grades, as shown on the drawings or staked in the field.

2. The dry mineral aggregate shall conform to the following 1 1/2-inch gradation:

1 ½ - inch Gradation

Sieve Size	% Passing Gradation Band
1 ½”	100
1"	90-100
¾”	70-85
½"	65-80
3/8”	55-75
#4	40-65
#16	25-40
#200	7-11

Variation to the above Gradation Schedule must be approved in writing by the Engineer.

3. The base course gravel shall uniformly be mixed with water prior to compaction.

4. Compaction shall be by Method A. If placed on native ground, the earth foundation shall be moistened and compacted to acquire at least ninety-five percent (95%) of the maximum density as determined in accordance with AASHTO Designation T-99, method D.

5. The aggregate shall have a percentage wear not exceeding 50% when tested in accordance with ASSHTO designation T-96. Certification that the aggregate meets this wear test will be required of the Contractor prior to his placement of the base course.

6. The moisture content of the material at the time of compaction shall be between + 2% optimum and - 2% of optimum.

7. The Contractor shall select the source of material and submit certification the material meets these specifications to the Engineer for approval.

8. Measurement and Payment.
   a. Measurement will be by the square foot. Payment will be at the contract unit price. Such payment will constitute full compensation for furnishing, transporting and installing the 1-

inch untreated base course along with labor, equipment, materials, and all other items necessary and incidental to the performance of the work.

b. Bid Item 10, Granular Borrow, 6-inch Minus

1. This item shall consist of furnishing and placing the granular borrow required to the lines and grades shown on the drawings or as directed by the Engineer.

3. Granular borrow source must be approved by the Engineer for quality and consistency and must be non-plastic and meet the following gradation:

Non-Plastic 6-inch Granular Borrow	
	Percent Passing
6-inch	100%
4-inch	70%
#4	25%
#200	10%

4. The moisture content of the material at the time of compaction shall be between +2% optimum and -2% of optimum.

5. All borrow will be compacted by a sheeps foot compactor capable of applying a centrifugal force of 60,000 lbs.

6. Compaction shall be by Method A. Also, the earth foundation shall be moistened and compacted to acquire at least ninety-five percent (95%) of the maximum density as determined in accordance with AASHTO Designation T-99, Method D.

7. Measurement will be by the square foot. Payment will be at the contract unit price. Such payment will constitute full compensation for furnishing, transporting and installing the granular borrow along with labor, material, equipment, and all other items necessary and incidental to the performance of the work.

c. Bid Item 11, Stabilization Fabric (Combigrid 30/30)

1. This item shall consist of furnishing and placing a geotextile (stabilization fabric) on the subgrade surface prior to granular borrow placement.

2. Stabilization Fabric: The Fabric will be Geogrid/nonwoven composite Combigrid 30/30 Q1 151 GRK3.

   The fabric will be installed according to the manufacturer's recommendations.

3. Measurement will be by the square yard of fabric installed. Payment will be at the contract unit price. Such payment will constitute full compensation for furnishing, transporting and installing the Combigrid, equipment, labor, materials, and all other items necessary and incidental to the performance of the work.

CONSTRUCTION SPECIFICATION

32. CONCRETE FOR MINOR STRUCTURES

1. SCOPE

The work will consist of furnishing, forming, placing, finishing and curing portland cement concrete as required to build the structure named in Section 24 of this Specification.

2. MATERIALS

Portland cement will conform to the requirements of ASTM Specification C-150 for the specified type.

Aggregates will conform to the requirements of ASTM Specification C-33 unless otherwise specified. The grading of coarse aggregates will be as specified in Section 24.

Water will be clean and free from injurious amounts of oil, salt, acid, alkali, organic matter or other deleterious substances.

Performed expansion joint filler will conform to the requirements of ASTM Specification D 1752.

Waterstops will conform to the requirements of the applicable ASTM specification for the specified kinds.

3. CLASS OF CONCRETE

Concrete for minor structure will be classified as follows:

Class of Concrete	Maximum Water Content (gallons/bag)	Minimum Cement Content (bags/cu.yd.)
4000	7	6

4. AIR CONTENT AND CONSISTENCY

Unless otherwise specified, the slump will be 2 to 4 inches. If air entrainment is specified, the air content by volume will be 5 to 8 percent of the volume of the concrete. When specified or when directed by the Engineer, a water-reducing, set-retarding admixture approved by the Engineer will be used.

5. DESIGN OF THE CONCRETE MIX

The proportions of the aggregates will be such as to produce a concrete mixture that will work readily into the corners and angles of the forms and around reinforcement when consolidated, but will not segregate or exude free water during consolidation.

Prior to placement of concrete, the Contractor will furnish the Engineer, for approval, a statement of the materials and mix proportions (including admixtures, if any) he intends to use. The statement will include evidence satisfactory to the Engineer that the materials and proportions will produce concrete conforming to this specification. The materials and proportions so stated will constitute the "job mix." After a job mix has been approved, neither the source, character or grading of the aggregates nor the type or brand of cement or admixture will be changed without prior notice to the Engineer. If such changes are necessary, no concrete containing such new or altered materials will be placed until the Engineer has approved a revised job mix.

6. INSPECTION AND TESTING

The Engineer will have free entry to the plant and equipment furnishing concrete under the contract. Proper facilities will be provided for the Engineer to inspect materials, equipment and processes and to obtain samples of the concrete. All tests and inspections will be conducted so as not to interfere unnecessarily with manufacture and delivery of the concrete.

7. HANDLING AND MEASUREMENT OF MATERIALS

Materials will be stockpiled and batched by methods that will prevent segregation or contamination of aggregates and insure accurate proportioning of the ingredients of the mix.

Cement will be measured by weight or in bags of 94 pounds each. When cement is measured in bags, no fraction of a bag will be used unless weighed.

Aggregates will be measured by weight. Mix proportions will be based on saturated, surface-dry weights. The batch weight of each aggregate will be the required saturated, surface- dry weight plus the weight of surface moisture it contains.

Water will be measured, by volume or by weight, to an accuracy within one percent of the total quantity of water required for the batch.

Admixtures will be measured within a limit of accuracy of three percent.

8. MIXERS AND MIXING

Concrete will be uniform and thoroughly mixed when delivered to the work. Variations in slump of more than 1 inch within a batch will be considered evidence of inadequate mixing and will be corrected by increasing mixing time or other means.

For stationary mixers, the mixing item after all cement and aggregates are in the mixer drum will not be less than 1 ½ minutes. When concrete is mixed in a truck mixer, the number of revolutions of the drum or blades at mixing speed will be not less than 70 nor more than 100

No mixing water in excess of the amount called for by the job mix will be added to the concrete during mixing or hauling or after arrival at the delivery point.

9. FORMS

Forms will be of wood, plywood, steel or other approved material and will be mortar tight. The forms and associated false work will be substantial and unyielding and will be constructed so that the finished concrete will conform to the specified dimensions and contours. Form surfaces will be smooth and free from holes, dents, sags or other irregularities. Forms will be coated with a nonstaining form oil before being set into place.

Metal ties or anchorages within the forms will be equipped with cones, she-bolts or other devices that permit their removal to a depth of at least one inch without injury to the concrete. Ties designed to break off below the surface of the concrete will not be used without cones.

All edges that will be exposed to view when the structure is completed will be chamfered, unless finished with molding tools as specified in Section 18.

10. PREPARATION OF FORMS AND SUBGRADE

Prior to placement of concrete the forms and subgrade will be free of chips, sawdust debris, water, ice, snow, extraneous oil, mortar, or other harmful substances or coatings.

Any oil on the reinforcing steel or other surfaces required to be bonded to the concrete will be removed. Rock surfaces will be cleaned by air-water cutting, wet sandblasting or wire brush scrubbing, as necessary, and will be wetted immediately prior to placement of concrete. Earth surfaces will be firm and damp. Placement of concrete on mud, dried earth or uncompacted fill frozen subgrade will not be permitted.

Unless otherwise specified, when concrete is to be placed over drain fill, the contact surface of the drain fill will be covered with a layer of asphalt-impregnated building paper or polyvinyl sheeting prior to placement of the concrete. Forms for weepholes will extend through this layer into the drain fill.

Items to be embedded in the concrete will be positioned accurately and anchored firmly.

Weepholes in walls or slabs will be formed with nonferrous materials.

11. **CONVEYING**

Concrete will be delivered to the site and discharged into the forms within 1 ½ hours after the introduction of the cement to the aggregates. In hot weather or under conditions contributing to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and discharge will not exceed 45 minutes. The Engineer may allow a longer time, provided the setting time of the concrete is increased a corresponding amount by the addition of an approved set-retarding admixture. In any case, concrete will be conveyed from the mixer to the forms as rapidly as practicable by methods that will prevent segregation of the aggregates or loss of mortar. Concrete will not be dropped more than five feet vertically unless suitable equipment is used to prevent segregation.

12. **PLACING**

Concrete will not be placed until the subgrade, forms and steel reinforcement have been inspected and approved. No concrete will be placed except in the presence of the Engineer. The Contractor will give reasonable notice to the Engineer each time he intends to place concrete. Such notice will be far enough in advance to give the Engineer adequate time to inspect the subgrade, forms, steel reinforcement and other preparations for compliance with the specifications before concrete is delivered for placing.

The concrete will be deposited as closely as possible to its final position in the forms and will be worked into the corners and angles of the forms and around all reinforcement and embedded items in a manner to prevent segregation of aggregates or excessive laitance. Unless otherwise specified, slab concrete will be placed to design thickness in one continuous layer. Formed concrete will be placed in horizontal layers not more than 20 inches thick. Hoppers and chutes, pipes or “elephant trunks” will be used as necessary to prevent splashing of mortar on the forms and reinforcing steel above the layer being placed.

Immediately after the concrete is placed in the forms, it will be consolidated by spading, hand tamping or vibration as necessary to insure smooth surfaces and dense concrete. Each layer will be consolidated to insure monolithic bond with the preceding layer. If the surface of a layer of concrete in place sets to the degree that it will not flow and merge with the succeeding layer when spaded or vibrated, the Contractor will discontinue placing concrete and will make a construction joint according to the procedure specified in Section 13.

If placing is discontinued when an incomplete horizontal layer is in place, the unfinished end of the layer will be formed by a vertical bulkhead.

13. CONSTRUCTION JOINTS

Construction joints will be made at the location shown on the drawings. If construction joints are needed which are not shown on the drawings, they will be placed in locations approved by the Engineer.

Where a feather edge would be produced at a construction joint, as in the top surface of a sloping wall, an insert form will be used so that the resulting edge thickness on either side of the joint is not less than 6 inches.

In walls and columns, as each lift is completed, the top surfaces will be immediately and carefully protected from any condition that might adversely affect the hardening of the concrete.

Steel tying and form construction adjacent to concrete in place will not be started until the concrete has cured at least 12 hours. Before new concrete is deposited on or against concrete that has hardened, the forms will be retightened. New concrete will not be placed until the hardened concrete has cured at least 12 hours.

Surfaces of construction joints will be cleaned of all unsatisfactory concrete, liatance, coating or debris by washing and scrubbing with a wire brush or wire broom or by other means approved by the Engineer. The surfaces will be kept moist for at least one hour prior to placement of the new concrete.

14. EXPANSION AND CONTRACTION JOINTS

Expansion and contraction joints will be made only at locations shown on the drawings.

Exposed concrete edges and expansion and contraction joints will be carefully tooled or chamfered, and the joints will be free of mortar and concrete. Joint filler will be left exposed for its full length with clean and true edges.

Preformed expansion joint filler will be held firmly in the correct position as the concrete is placed.

When open joints are specified, they will be constructed by insertion and subsequent removal of a wooden strip, metal plate or other suitable template in such a manner that the corners of the concrete will not be chipped or broken. The edges of open joints will be finished with an edging tool prior to removal of the joint strips.

15. WATERSTOPS

Waterstops will be held firmly in the correct position as the concrete is placed. Joints in the metal waterstops will be soldered, brazed or welded. Joints in rubber or plastic waterstops will be cemented, welded or vulcanized as recommended by the Manufacturer.

16. REMOVAL OF FORMS

Forms will not be removed without the approval of the Engineer. Forms will be removed in such a way as to prevent damage to the concrete. Supports will be removed in a manner that will permit the concrete to take the stresses due to its own weight uniformly and gradually.

17. FINISHING FORMED SURFACES

Immediately after the removal of the forms:

a. All fins and irregular projections will be removed from exposed surfaces.

b. On all surfaces, the holes produced by the removal of form ties, cone-bolts, and she-bolts, will be cleaned, wetted and filled with a dry-pack mortar consisting of one part portland cement, three parts sand that will pass a No. 16 sieve, and water just sufficient to produce a consistency such that the filling is at the point of becoming rubbery when the material is solidly packed.

18. FINISHING UNFORMED SURFACES

All exposed surfaces of the concrete will be accurately screened to grade and then wood float finished, unless specified otherwise.

Excessive floating or troweling of surfaces while the concrete is soft will not be permitted.

The addition of dry cement or water to the surface of the screened concrete to expedite finishing will not be allowed.

Joints and edges on unformed surfaces that will be exposed to view will be chamfered or finished with molding tools.

19. CURING

Concrete will be prevented from drying for a curing period of at least 7 days after it is placed. Exposed surfaces will be kept continuously moist for the entire period, or until

curing compound is applied as specified below. Moisture will be maintained by sprinkling, flooding, or fog spraying or by covering with continuously moistened canvas, cloth mats, straw, sand or approved material. Wood forms (except plywood) left in place during the curing period will be kept wet. Formed surfaces will be thoroughly wetted immediately after forms are removed and will be kept wet until patching and repairs are completed. Water or covering will be applied in such a way that the concrete surface is not eroded or otherwise damaged.

Concrete, except at construction joints, may be coated with an approved curing compound in lieu of continued application of moisture. The compound will be sprayed on the moist concrete surfaces as soon as free water has disappeared, but will not be applied to any; surface until patching, repairs and finishing of that surface are completed. The compound will be applied at a uniform rate of not less than one gallon per 150 square feet of surface and will form a continuous adherent membrane over the entire surface. Curing compound will not be applied to surfaces requiring bond to subsequently placed concrete, such as construction joints, shear plates, reinforcing steel and other embedded items. If the membrane is damaged during the curing period, the damaged area will be re-sprayed at the rate of application specified above.

20. REMOVAL OR REPAIR

When concrete is honeycombed, damaged or otherwise defective, the Contractor will remove and replace the structure or structural member containing the defective concrete or, where feasible, correct or repair the defective parts. The Engineer will determine the required extent of removal, replacement or repair.

Prior to starting repair work the Contractor will obtain the Engineer's approval of his plan for effecting the repair. The Contractor will perform all repair work in the presence of the Engineer.

21. CONCRETE IN COLD WEATHER

Concrete will not be mixed nor placed when the daily minimum atmospheric temperature is less than 40° F unless facilities are provided to prevent the concrete from freezing. The use of accelerators or antifreeze compounds will not be allowed.

22. CONCRETE IN HOT WEATHER

The Contractor will apply effective means to maintain the temperature of the concrete below 90° F during mixing, conveying and placing.

23. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, concrete will be measured to the neat lines shown on the drawings and the volume of the concrete will be computed to the nearest 0.1 cubic yard. Measurement of concrete placed against the sides of an excavation without the use of intervening forms will be made only to the neat lines or pay limits shown on the drawings. No deduction in volume will be made for chamfers, rounded or beveled edges or for any void or embedded item that is less than 3 cubic feet in volume.

Payment for each item of concrete for minor structures will be made at the contract unit price or the contract lump sum, whichever is applicable, for that item. Such payment will constitute full compensation for all labor, materials, equipment, transportation, tools, forms, false work, bracing and all other items necessary and incidental to the completion of the work, except items listed for payment elsewhere in the contract.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 24 of this specification.

24. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details include:

a. Bid Item 12, Reconstruct Utility Access

1. This item shall consist of reconstructing the utility access, as required and as shown on the drawings, along with the necessary excavation, backfill, forming and curing to the lines and grades shown on the drawings or as directed by the Engineer.

2. All cement used shall be Type V, meeting the requirements of ASTM C 150.

3. Concrete mix design will be in accordance with Section 5.

4. Class 2 course aggregate shall be size 57 (1" to No. 4, ASTM C-33 Table II).

5. Air entrainment shall be required. Air content by volume shall be 5 to 8 percent of the volume of the cement.

6. Measurement shall be based upon the number of utility accesses reconstructed. Payment will be made according to the contract unit price for

this bid item. Such payment will constitute full compensation for all labor, materials equipment, transportation, and all other items necessary and incidental to the completion of the work.

b. Bid Item 13, Reconstruct Inlet Box

1. This item shall consist of reconstructing the inlet boxes, as required and as shown on the drawings, along with the necessary excavation, backfill, forming and curing to the lines and grades shown on the drawings or as directed by the Engineer.

2. All cement used shall be Type V, meeting the requirements of ASTM C 150.

3. Concrete mix design will be in accordance with Section 5.

4. Class 2 course aggregate shall be size 57 (1" to No. 4, ASTM C-33 Table II).

5. Air entrainment shall be required. Air content by volume shall be 5 to 8 percent of the volume of the cement.

6. Measurement shall be based upon the number of inlet boxes reconstructed.

7. Payment will be made according to the contract unit price. Such payment will constitute full compensation for all labor, materials equipment, transportation, and all other items necessary and incidental to the completion of the work.

c. Bid Item 14, Remove Ramp

1. This item shall consist of removing the ramps, as required and as shown on the drawings, along with the necessary excavation, and backfill, to the lines and grades shown on the drawings or as directed by the Engineer.

2. Disposal of removed material will be the responsibility of the Contractor. Disposal will be at an approved site. Disposal fees will be paid by the Contractor.

3. Measurement shall be based upon the number of ramps removed. Payment will be made according to the contract unit price. Such payment will constitute full compensation for all labor, materials equipment, transportation, and all other items necessary and incidental to the completion of the work.

d. Bid Item 15, Remove Sidewalk

1. This item shall consist of removing the sidewalk, as required and as shown on the drawings, along with the necessary excavation, and backfill, to the lines and grades shown on the drawings or as directed by the Engineer.

2. Disposal of removed material will be the responsibility of the Contractor. Disposal will be at an approved site. Disposal fees will be paid by the Contractor.

3. Measurement will be by the square foot of sidewalk removed. Payment will be at the contract unit price. Such payment will constitute full compensation for all labor, materials equipment, transportation, and all other items necessary and incidental to the completion of the work.

e. Bid Item 16, Curb Wall

1. This item will consist of furnishing and placing the portland cement concrete as required to construct the curb wall, as required and as shown on the drawings along with the necessary excavation and fill.

2. All cement used will be Type V.

3. Concrete will be class 4000.

4. Concrete mix design will be in accordance with Section 5.

5. Minimum cement content will be 6 bags per cubic yard.

6. Class 2 course aggregate will be size 57 (1" to No. 4, ASTM C-33 Table II).

7. Air entrainment will be required. Air content by volume will be 5 to 8 percent of the volume of the concrete,

8. Contractor will be required to backfill all excavation voids with topsoil in back of wall and hand rake to blend to the existing ground to create a smooth and uniform surface as shown on the drawings, or as directed by the Engineer.

9. Fly ash will not be allowed in the concrete.

10. Contractor will be required to apply curing compound as soon as finishing

has been completed.

11. Curb and gutter damaged during construction will be replaced by the Contractor at his expense.

12. Measurement will be by the linear foot of wall installed. Payment will be made at the contract unit price. Such payment will constitute full compensation for all labor, materials, equipment, transportation, tools, forms, bracing, excavation, compacted fill, and all other items incidental to the completion of the curb wall.

f. Bid Item 17, Concrete Curb Block

1. This item will consist of forming, furnishing, and placing the portland cement concrete as required to construct the Concrete Curb Block, as shown on the drawings.

2. All cement used will be Type V.

3. Concrete will be Class 4000.

4. Concrete mix design will be in accordance with Section 5.

5. Minimum cement content will be 6 bags per cubic yard.

6. Class 2 course aggregate will be size 57 (1" to No. 4, ASTM C-33 Table II).

7. Air entrainment will be required. Air content by volume will be 5 to 8 percent of the volume of the cement.

8. The earth foundation under the base course will be moistened and rolled by means of vibratory compactors.

9. Contractor will be required to apply curing compound as soon as finishing has been completed.

10. Fly ash will not be allowed in the concrete.

11. Three inches of untreated base is required under all access approaches.

12. Measurement will be made by each item actually installed. Payment for each item will be made at the contract unit price. The payment will constitute full compensation for all labor, materials, equipment, transportation, tools, forms, bracing, excavation, compacted fill, untreated base course, and all other items necessary and incidental to the completion

of the concrete work.

CONSTRUCTION SPECIFICATION

93. PAVEMENT MARKING PAINT

1. **SCOPE**

The work shall consist of furnishing and applying ready mixed traffic paint to asphaltic
or concrete pavement.

2. **MATERIALS**

Furnish VOC Compliant Solvent Based or Acrylic Water Based Pavement marking paint meeting Federal Specification TTP-115 F for Low Volatile Organic Compounds (VOC) of 1.25 lbs/gal.

Apply to asphaltic or concrete pavement as edge lines, center lines, broken lines, guide lines, symbols and other related markings.

Remove pavement markings.

REFERENCES

1. AASHTO M247: Glass Beads Used in Traffic Paint.

2. ASTM D 562: Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using the Stormer-Type Viscometer.

3. ASTM D 711: No-Pick-Up Time of Traffic Paint.

4. ASTM D 2205: Selection of Tests for Traffic Paints.

5. ASTM D 2743: Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography.

6. ASTM D 3723: Pigment Content of Water-Emulsion Paints.

7. ASTM D 3960: Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

8. ASTM D 4451: Pigment Content of Paints

9. ASTM D 5381: S-Ray Fluorescence (XRF) Spectroscopy of Pigments and and

Extenders.

10. Federal Standards 595B, 37875, 33538, and 11105.

ACCEPTANCE

1. Repaint any line or symbol failing to meet bead adherence and dimensional requirements.

2. Repaint any line or symbol failing to meet the minimum application requirements for paint or beads. (Road Only)

PAINT

1. Choose an approved pavement marking paint UDOT's "Accepted Products Listing". Follow Federal Standards 595B, 37875, 33538, and 11105. Meet the following requirements for VOC Compliant Solvent Based Paint or Acrylic Water Based Paint:

CIELAB (L*a*b*) D65/10°		
White	Yellow	Red
L* 91.9 to 95.6	L* 70.0 to 72.7	L* 31.4 to 33.4
a* -1.8 to -2.1	a* 22.5 to 24.8	a* 51.6 to 52.6
b* 3.8 to 2.2	b* 89.7 to 73.9	b* 34.1 to 35.1

a. No-track time: Not more than 5 minutes when tested according to ASTM D 711.
b. Volatile Organic Compounds Content: Less than 1.25 lbs/gal ASTM D 3960.
c. Free of lead, chromium, or other related heavy metals ASTM D 5381.
d. Pigment: Percent by weight: Acrylic Water Based minimum of 62.0 ± 2.0 VOC Compliant Solvent minimum of 52.0. ASTM D 3723.
e. Total Solids: Percent by weight: Acrylic Water Based minimum of 77.0 VOC Compliant Solvent minimum of 70.0 ASTM D 2205.
f. Acrylic water based paint must contain a minimum of 40 percent, by weight, 100 percent acrylic cross-linkable emulsion as determined by infrared analysis and other chemical analysis available to UDOT. ASTM D 2205 and UDOT Manual of Instruction Section 996.

g. VOC compliant solvent based paint must contain 37.5 percent, by weight, copolymer alkyd-resin ASTM D 2205.
h. ASTM D 562, ASTM D 2743, ASTM D 4451 and ASTM D 5381: Tests used to verify paint samples meet "Accepted Products Listing."

GLASS SPHERE (BEADS) USED IN PAVEMENT MARKING PAINT

1. Specific Properties:
   a. Meet AASHTO M 247.
   b. Meet type II, uniform gradation.

3. PREPARATION

1. Line Control.
   a. Establish control points as required.
   b. Maintain the line within 0 inches of the established control points and mark the roadway and parking stalls.
      1. Remove paint that is not placed within tolerance of the established control points and replace at no expense to the Owner.

2. Remove dirt, loose aggregate and other foreign material and follow manufacturer's recommendations for surface preparation.

4. APPLICATION

1. Pavement Marking Paint: Apply at the following rates:
   a. 4 inch Solid Line: From 270 to 350 ft/gal
   b. 4 inch Broken Line: From 1080 to 1400 ft/gal
   c. 8 inch Solid Line: From 135 to 175 ft/gal

2. Replace pavement markings that are less than 14 wet mils in thickness.

3. No payment for pavement markings placed in excess of 18 wet mils in thickness.

4. Painted Legends and Symbols 1 gallon per 100 square feet.

5. Glass Sphere (Beads): Apply a minimum of 8 lbs/gal of paint, the full length and width of line and pavement markings.

6. Begin striping operations no later than 24 hours after ordered by the Engineer.

7. At time of application apply lines and pavement markings only when the air and pavement temperature are:
   a. 40 degrees F and rising for VOC Compliant Solvent Based Paint.

b. 50 degrees F and rising for Acrylic Water Based Paint.

8. Comply with Traffic Control Drawing TC-16

5. CONTRACTOR QUALITY CONTROL

1. Application Rate: Verify that the paint and beads are being applied within specified tolerances prior to striping.

6. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 18, Pavement Marking

1. This item shall consist of the striping and furnishing and installing three (3) van accessible handicap signs as shown on the drawings and as required for performing the work under this contract.

2. Line Control

- Establish control points for parking stalls as shown on the drawings.
- Maintain the line within 1 inch of the established control points and mark the parking lot as needed.
- Paint handicap symbols as shown on the drawings.
- Glass sphere (beads) will not be required.

3. Broom or Sweep the pavement surface and remove dirt, loose stones and other foreign material.

4. Equipment

Equipment manufactured specifically for applying paint.
Use only workmen experienced in operating the equipment.

5. Restrictions

- The Contractor shall begin striping operations no later than 24 hours after written order by the Engineer.

- Apply traffic striping only when the air and pavement temperature are 40°F. or higher.

6. Application Rates

Paint - apply at the following rates:

	Linear Feet/Gallon
4" Solid Stripe	From 190 to 240
4" Dashed Stripe	From 760 to 960
8" Solid Stripe	From 95 to 125

Beads

- A minimum of 6 pounds/gallon of paint **(Not Required)**

- Apply beads the full length of the line **(Not Required)**

7. Signs

Van accessible signs will be as shown on the drawings.

7. STRIPING

One coat of striping is to be applied within 7 (seven) days of applications of Slurry Seal. (1ST coat)

Second coat of striping is to be applied 45 (forty five) to 60 (sixty) after application of Slurry Seal. All Slurry Seal is to be swept clean of debris before application of second coat of striping.

8. MEASUREMENT

Measurement shall not be made but shall be Lump Sum as noted on the Contract

Unit of Measure.

9. **PAYMENT**

The lump sum quantity will be paid for at the contract unit price. The payment will constitute full compensation or all labor, materials, equipment, transportation, tools, and all other items necessary or incidental to the completion of this item.