STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

February 8, 2010

VETERAN'S MEMORIAL CEMETERY PAVING IMPROVEMENTS

UTAH NATIONAL GUARD

BLUFFDALE, UTAH

DFCM Project Number 09111490

King Engineering, Inc.
2825 East Cottonwood Parkway
Salt Lake City, Utah 84121

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 6. Supplemental General Conditions" or are available upon request from DFCM:

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 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:

VETERAN'S MEMORIAL CEMETERY PAVING IMPROVEMENTS
UTAH NATIONAL GUARD – BLUFFDALE, UTAH
DFCM PROJECT NO: 09111490

Bids will be in accordance with the Contract Documents that will be available on **Monday, February 8, 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 $147,000.00.

A **mandatory** pre-bid meeting will be held at **2:00 PM on Wednesday, February 10, 2010** at Veteran's Memorial Cemetery, located at 17111 South Camp Williams Rd., Bluffdale, Utah. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of **3:00 PM on Tuesday, February 23, 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

The Veteran's Memorial Cemetery paving improvement project consists of an overlay and reconstruction of the lower (East) roadway through the cemetery. Included in the project will be widening of the roadway and installation of concrete curbing along the west side; and as an Alternate, the plan is to reconstruct the entrance to the roadway leading to the facility maintenance area.

This will be a challenging project; the Cemetery will be open to the public for visitation and funerals for the duration of the project. This may present many challeges for the Contractor, especially taxing his ability to schedule work necessary to maintain a reverent atmosphere during funeral services. It will be imparitive that the Contractor regularly communicates with the staff at the Cemetery and be willing to adjust work necessary to accommodate these events. The Contractor will also be required to keep a safe work site, including pedestrian and traffic barricades around work area(s).

PROJECT SCHEDULE

PROJECT NAME: VETERAN'S MEMORIAL CEMETERY PAVING IMPROVEMENTS
UTAH NATIONAL GUARD – BLUFFDALE, UTAH
DFCM PROJECT NO. 09111490

Event	Day	Date	Time	Place
Bidding Documents Available	Monday	February 8, 2010	10:00 AM	DFCM 4110 State Office Bldg SLC, UT and the DFCM web site *
Mandatory Pre-bid Site Meeting	Wednesday	February 10, 2010	2:00 PM	Veteran's Memorial Cemetery 17111 So. Camp Williams Rd. Bluffdale, Utah
Last Day to Submit Questions	Monday	February 15, 2010	10:00 AM	*In Writing to:* Brent Lloyd, Project Manager brentlloyd@utah.gov Fax 801-538-3267
Addendum Deadline (exception for bid delays)	Thursday	February 18, 2010	10:00 AM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Tuesday	February 23, 2010	3:00 PM	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Wednesday	February 24, 2010	3:00 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	May 14, 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 **Veteran's Memorial Cemetery Paving Improvements - Utah National Guard – Bluffdale, Utah – DFCM Project No. 09111940** 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: _____

VETERANS CEMETERY PAVING IMPROVEMENTS
UNIT PRICE PROPOSAL
DFCM PROJECT NO. 09111940

BASE BID

Item No.	Work or Materials	Approximate Quantities/Units		Unit Price	Amount
1.	Saw Cut Asphalt	342	L.F.	$_____	$_____
2.	Remove and Dispose of Existing Asphalt Pavement, Base, and Subgrade to a 13" Depth and Dispose of Off Site	8,711	S.F.	$_____	$_____
3.	Remove Native Material And Dispose of Off Site	305	C.Y.	$_____	$_____
4.	Remove and Relocate Existing Sign, Post and Base	6	EACH	$_____	$_____

5.	Remove Existing Concrete Mow Strip	591	L.F.	$_____	$_____
6.	Furnish and Install Concrete Roll Gutter	1,584	L.F.	$_____	$_____
7.	Furnish and Install Soil Stearilent	15,003	S.F.	$_____	$_____
8.	Furnish and Install 8” of Compacted Road Base	15,003	S.F.	$_____	$_____
9.	Furnish and Install 3” of Compacted Asphalt	15,003	S.F.	$_____	$_____
10.	Furnish and Install 2” Of Compacted Asphalt Overlay with Fabric	51,029	S.F.	$_____	$_____
11.	Furnish and Install 12” Compacted Structural Fill and Geotextile Fabric	1,450	S.F.	$_____	$_____
12.	Furnish and Install Paint Striping and Signing	1	L.S.	$_____	$_____
13.	Irrigation Modification	1	L.S	$_____	$_____

BASE BID: For all Alternate 1 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)

ALTERNATE 1

Item No.	Work or Materials	Approximate Quantities/Units		Unit Price	Amount
1.	Remove Native Material And Dispose of Off Site	66	C.Y.	$_____	$_____
2.	Furnish and Install Soil Stearilent	1,490	S.F.	$_____	$_____
3.	Furnish and Install 8” of Compacted Road Base	1,490	S.F.	$_____	$_____
4.	Furnish and Install 3” of Compacted Asphalt	1,490	S.F.	$_____	$_____

5.	Furnish and Install 2” Of Compacted Asphalt Overlay with Fabric	1,490	S.F.	$_____	$_____
6.	Furnish and Install 12” Gravel	8,517	S.F.	$_____	$_____
7.	Furnish and Install 12” Compacted Structural Fill and Geotextile Fabric	150	S.F.	$_____	$_____

ADDITIVE ALTERNATE #1: 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 May 14, 2010, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$250.00** 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 found in the specifications. 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 and July 1, 2009 ("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
July 1, 2009
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:

09111790 VETERENS CEMETERY ROAD
INDEX TO TECHNICAL SPECIFICATIONS

02061 Select Aggregate
02075 Geotextiles
02100 Site Preparation
02230 Base Course
02511 Asphaltic Concrete Paving
02525 New Concrete
02763 Pavement Marking and Signing
03100 Concrete Formwork
03200 Concrete Reinforcement
03300 Cast In Place Concrete

SECTION 02061

SELECT AGGREGATE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Select fill materials and procedures.

1.2 RELATED SECTIONS

. Section 02075: Geotextiles

B. Section 02511: Asphalt Paving

1.3 DEFINITIONS

A. Select fill: Aggregate materials meeting requirements of this Section.

1.4 QUALITY ASSURANCE

A. Remove products found defective after installation and install acceptable products at no additional cost to the State.

1.05 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. **Furnish and Install 12" of Compacted Select Fill and Ground Stabilization Fabric**. Measurement and payment will be based upon the in-place square footage of select fill furnished and placed and compacted to a 1' depth and woven geotextile fabric furnished and installed in accordance with the plans and these specifications. Payment shall include the cost for all materials, labor, tools, equipment, etc. to complete this work.

PART 2 PRODUCTS

2.1 STRUCTURAL FILL FOR PAVED AREAS

A. Shall be untreated natural stone

1. Shall not be lumpy or frozen.

2. Shall be free from noticeable concentrations of alkali, salt, shale, and petroleum products, all roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that, in the opinion of the Engineer, is objectionable or deleterious.

3. Shall be graded within the following limits: Use the following gradations:

TABLE 2

Paved Area Select Fill	
Sieve Size	Percent passing
4"	100
2"	70-95
3/4"	45-95
#4	28-75
#10	20-62
#40	5-40
#200	0-15

PART 3 EXECUTION

3.1 INSTALLATION

A. Select Fill:

1. Overexcavate area under future pavement to a 2' depth beneath bottom of pavement section (asphalt and roadbase).
2. Place woven ground stabilization geotextile fabric in accordance with manufacturers recommendations. See Section 02075 Geotextiles.
3. Place and compact select fill in 4 - 6 inch lifts above fabric for a total of 2' of compacted select fill.
4. Compact backfill material in 6 inch layers to a 96 percent density when placing the fill under paved areas.

END OF SECTION

SECTION 02075

GEOTEXTILES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for installing geotextiles of the type(s) shown on the drawings, and at other locations as directed by the Engineer.

1.2 RELATED SECTIONS

. Section 02061: Select Aggregate

1.3 REFERENCES

A. AASHTO M 288: Geotextile Specifications for Highway Applications.

B. ASTM D 4791: Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

1.4 SUBMITTALS

A. Submit prior to use: Manufacturer's certificate that each fabric complies with requirements of this Section.

1.5 SAMPLING AND TESTING

A. Not Used

1.6 PACKAGING, SHIPPING, AND STORING

A. Protect the geotextile from direct sunlight, chemicals, mud, dirt and debris during shipment and storage. Replace at the Contractor's sole expense, any geotextile damaged or deteriorated during shipping, storage or construction.

B. Labeling and Tagging:
   1. Identify each package by a tag or label securely affixed to the outside of the roll on at least one end.
   2. Provide the following required information on the tag:
      a. Name of the geotextile manufacturer
      b. Brand name of the product, width, length, and package weight of geotextile

1.7 ACCEPTANCE

A. DFCM will reject geotextile at installation if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transport, handling or storage.

PART 2 PRODUCTS

2.1 STABILIZATION GEOTEXTILE

A. Furnish a non-woven geotextile material as approved by Engineer.

PART 3 EXECUTION

3.1 GENERAL

A. Place geotextile on areas that are smooth, and free of projections or depressions. Do not drag the geotextile across the subgrade.

B. Do not operate construction equipment or traffic directly on geotextile.

C. When placed for construction, cover the geotextile with indicated cover material as soon as possible. Do not leave uncovered for more than 5 days.

D. Place cover material on the geotextile in a manner that the geotextile is not torn, punctured, or shifted.

E. Limit construction vehicles in size and mass so rutting in the initial layer above the geotextile is not more than 3 inches deep, or half the layer thickness, whichever is the lesser. Turning of vehicles on the first layer is not permitted.

3.2 INSTALLING STABILIZATION GEOTEXTILE FABRIC

A. Install Stabilization Geotextile under all structural fill as required by the drawings and specifications.

B. Unless otherwise specified, overlap the geotextile a minimum of 2 feet at all longitudinal and transverse joints.

C. For placement on slopes, overlap each sheet over the next downhill sheet.

D. Repair: Place patch over damaged area and extend 3 feet beyond the perimeter of the tear or damage.

E. Place fill, beginning with the sheet(s) overlapped above subsequent sheet(s), to hold geotextile in place.

F. Pins, usually 18 inches long, may be helpful in securing the geotextile during installation.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Preparation

B. Asphaltic concrete pavement removal

C. Portland cement concrete removal

D. Disposal of waste materials

1.02 QUALITY ASSURANCE

A. Not Applicable

1.03 MEASUREMENT AND PAYMENT

A. **Remove and Dispose of Existing Asphalt Pavement, Base, and Subgrade to a 13" Depth and Dispose of Off Site**. Measurement and payment for this bid item will be based upon the in-place square footage of asphalt surface course, base course and subgrade material removed to a 13" depth and disposed of at an approved facility off-site. Payment shall include the cost of all labor, materials, tools, machinery, permits, etc. to complete this work.

B. **Remove and Dispose of Mow Strip**. Measurement and payment for this bid item will be based upon the in-place lineal footage of concrete mow strip removed and disposed of at an approved facility off-site. Payment shall include the cost of all labor, materials, tools, machinery, permits, etc. to complete this work.

C. **Saw Cut Asphalt.** Measurement and payment shall be based upon the total lineal footage of existing asphalt saw cut to a one inch depth. Such payment shall include all labor, tools, equipment and material needed to complete this work.

D. **Furnish and Install Soil Stearilent**. Measurement and payment for this bid item shall be based upon the in-place square footage of water soluble herbicide for non-selective control of annual and perennial weeds in strict accordance with manufacturers instructions and all laws and regulations. Payment shall include the cost of all labor, materials, tools, machinery, permits, etc. to complete this work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 PREPARATION

A. No clearing, demolition, or removal of any kind shall proceed until all existing trees, improvements, etc. to be removed have been established and are inspected and documented by the Owner.

B. Establish necessary clearing limits within the construction limits. Mark all trees, shrubs, structures, fences, concrete, and other improvements to be removed.

C. Trees, shrubs and lawn, areas to receive planting, rock outcroppings, fences, sprinklers and other improvements that are not to be removed shall be protected from damage or injury. If damaged or removed, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible. Trees, shrubs, and improvements not to be removed shall be marked in field by Owner and/or shown on the Drawings.

D. Give reasonable notice to Owner to permit him to salvage plants, trees, fences, sprinklers and other improvements within the construction limits that may be destroyed because of the work.

E. Notify all utility companies to be present if disturbing ground in the vicinity of utilities. Contractor shall pot hole and verify the locations and bury depths of all utilities including water, storm drain, telephone, gas and electrical before digging. All Utility relocations shall be done in accordance with the owners and operators standards and requirements.

G. Protect active utility systems adjacent to or uncovered by any excavation during site preparation.

H. Maintain benchmarks, monuments and other reference points and construction stakes.

3.02 ASPHALT PAVEMENT REMOVAL

A. Sawing shall be used to ensure the breakage of pavement along straight lines.

3.03 DISPOSAL OF WASTE MATERIALS

A. Where salvage is not required as otherwise specified herein or as shown on the drawings, dispose of all removed materials at a suitable off-site location in accordance with applicable laws and ordinances.

B. No burning shall be allowed.

END OF SECTION

SECTION 02230

BASE COURSE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Subgrade preparation to lines and grades shown on the plan.

B. Place, grade and compact base and sub-base course materials.

C. Dust and surface water control.

1.02 RELATED WORK

A. Section 02511 - Asphaltic Concrete Paving

1.03 REFERENCES

A. American Society for Testing Materials (ASTM).

B. American Association of Safety and Highway Transportation Officials (AASHTO)

1.04 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

. **Furnish and Install 8" of Compacted Road Base.** Measurement and payment shall be based upon the total square footage of 8" of compacted road base furnished and installed according to the plans and specifications. Such payment shall include all labor, tools, equipment and material needed to complete this work.

PART 2 PRODUCTS

2.01 BASE COURSE MATERIAL

A. Road Base for Pavement Preparation:

1. Shall be untreated natural stone

2. Shall not be lumpy or frozen.

3. Shall be free from noticeable concentrations of alkali, salt, shale, and petroleum products, all roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that, in the opinion of the Engineer, is objectional or deleterious.

4. Shall be graded within the following limits:

Sieve Size	Percent Passing By Weight
1"	100
1/2"	70-100
No. 4	41-68
No. 16	21-41

No. 40	10-27
No. 200	4-13

PART 3 EXECUTION

3.01 PREPARATION OF SUBGRADE

A. Prior to placing base course materials, the subgrade shall be scarified to a depth of not less than 6", moistened or dried to optimum moisture content, and compacted to at least 95% maximum Modified Proctor Density as determined in accordance with ASTM D1557 (AASHTO T-180), and shall be within 2% of optimum moisture content.

B. The subgrade shall then be proof rolled.

C. If excessively soft, loose, or disturbed soils are encountered, they shall be removed as directed by the Engineer to a maximum depth of two feet (2') and replaced and recompacted to 96% maximum Modified Proctor Density using approved subgrade stabilizing material.

D. Ensure subgrade is to required lines and elevations.

3.02 PLACEMENT OF BASE COURSE

A. Protect against "pumping" moisture to surface by limiting travel on exposed subgrade. Where it is determined by the Owner that construction vehicle traffic (other than proof rolling) has caused subgrade instability, remove disturbed soils and replace with sand backfill at no additional cost to the Owner.

B. Apply water soluble herbicide for nonselective control of annual and perennial weeds in strict accordance with manufacturers instructions and all laws and regulations.

C. Place base course material on the prepared and accepted subgrade. The material shall be back-dumped and spread in a uniform lift thickness.

D. Handle and spread materials in a manner that will prevent segregation of sizes. When vibrating or other acceptable types of compaction equipment are used, the entire course shall be compacted in 2-4" lifts.

E. When base course is constructed in more than one layer, the previously placed layer shall be cleaned of loose and foreign matter. Upper layer of base course shall not be less than 1-1/2", nor shall fine materials be added to reach final grade.

F. Overstressing the subgrade soil and base course shall be avoided by utilizing equipment in spreading and dumping that exerts only moderate pressures on the soil. Avoid excessive travel on lower base course lifts. Severe rutting, cracking or yielding is an indication of overstressing the soil. Any ruts or cracks which develop in the base course during spreading or compacting shall be repaired as directed at no additional cost to Owner.

G. Base course shall be compacted to no less than 95% maximum Modified Proctor Density, as determined by ASTM D1557 (AASHTO T-180). Moisture content shall be maintained to within 1.5% of optimum throughout placing and compaction operations.

1. Compaction shall always be commenced along the edge of the area to be compacted and the roller shall gradually advance toward the center of the area to be compacted.

2. Compaction equipment shall be operated along lines parallel or concentric with the centerline of the road being constructed, and no material variation therefrom will be permitted.

H. Base course shall be substantially true to line and grade as indicated on the drawings. The surface shall be within 1/2" of required grade. Completed thickness of base course shall be within 1/2" of indicated thickness, with average thickness not less than that indicated.

I. The top surface of compacted base course shall be finished by blading or rolled with equipment designed for that purpose.

J. Temporary Graded Surface

1. When allowed by the local jurisdiction having authority, where trenches are excavated in paved traffic lanes, the surface course may be temporarily replaced by a surface consisting of base course material. The base course shall be removed and replaced with pavement as soon as conditions permit, or as required by local jurisdiction having authority.

2. The surface shall be maintained to provide for a smooth flow of traffic without holes, bumps, etc., until final acceptance of the work.

3.03 DUST AND SURFACE WATER CONTROL

A. Dust control measures shall be implemented by application of water to all work areas, storage areas, haul and access roads, or other areas affected by work.

B. All work shall be in compliance with the Federal, State and local air pollution standards, and not cause a hazard or nuisance to personnel and the public in the vicinity of the work.

C. Provide and operate at least one (1) mobile tank sprinkling unit during the contract period.

D. Other methods of dust control for haul and access roads may include chemical treatment, light bituminous treatment or other method as approved by the Owner.

E. Surface water shall be controlled to the extent that the areas to receive pavement, walks or slabs are not allowed to become wet from runoff from adjacent areas. Surface water shall be directed away from these areas but not directed toward adjacent property, buildings, or any improvement that may be damaged by water. Surface water shall not be allowed to enter sanitary sewers.

3.04 FIELD QUALITY CONTROL

A. Testing and inspection of placed Base Course will be provided by the Owner. Tests provided by the Owner are as follows:

Item	Type	Frequency
Base Course Aggregate Sampling	ASTM D75	Each day or 1 test/500 sq. yd., or as required.

Atterberg Limits	ASTM D2419, D423, and D424	As required
Sieve Analysis	ASTM C136	As required
Bearing Ratio	ASTM D1883	As required
Maximum Density	ASTM D1557, Method D	As required
In-place Density	ASTM D2167, D2922 and D3017	As required

B. If tests indicate that sub-base and/or base course do not meet specified requirements, remove defective work, replace and retest at no cost to Owner.

END OF SECTION

SECTION 02511

ASPHALTIC CONCRETE PAVING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Proof roll base course to reveal soft and yielding spots.

B. Place and compact asphaltic concrete paving.

C. Protection of newly placed pavement.

1.02 RELATED WORK

A. Section 02230 - Base Course

1.03 QUALITY ASSURANCE

A. Do not place asphaltic concrete paving when the air temperature in the shade and/or the roadbed temperature are below 50° F, or during rain, when the base course surface is wet, or during other adverse weather conditions.

B. Do not place tack coat when air temperature in the shade and the roadbed temperature are below 50° F, or during rain, fog, or other adverse weather conditions.

C. All work shall be performed by experienced and qualified workmen with equipment standard with the industry.

D. Approval by Engineer of sources of supply of materials shall be obtained prior to delivery of materials.

E. Comply with federal, state and/or local codes and regulations.

1.04 REFERENCES

A. American Society for Testing Materials (ASTM):

1. D1557, "Tests for Moisture - Density Relationship of Soils using 10 lb (4.5 kg) Rammer in 18 inch (457 mm) Drop".

2. D1559, "Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus".

3. D2041, "Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures".

4. D2170, "Kinematic Viscosity of Asphalts (Bitumens)".

B. THE ASPHALT INSTITUTE (A.I.) Specification Series No. 2 (SS-2).

C. American Association of State Highway and Transportation Officials (AASHTO):

1. Materials and compaction tests.
   a. AASHTO T-180

D. State of Utah Standard Specifications for Road and Bridge Construction, latest edition including Supplement #2.

1. Section 704.03 Asphaltic Cement.

1.05 SUBMITTALS

A. An asphaltic concrete paving mix design prepared by a certified laboratory and materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements shall be submitted for review and approval at least two weeks prior to commencement of the work.

B. Written certification of compliance for pavement marking paint.

1.06 WARRANTY

A. See General Conditions.

1.07 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

A. **Furnish and Install 3" of compacted Asphalt.** Measurement sand payment shall be based upon the square footage of actual asphalt installed and compacted to a 3" thickness according to the plans and specifications. Such payment shall include all labor, tools, equipment and material needed to complete this work.

B. **Furnish and Install 2" of compacted Asphalt Overlay with Fabric.** Measurement sand payment shall be based upon the square footage of actual asphalt installed and compacted to a 2" thickness over crack inhibiting geotextile fabric according to the plans and specifications. Such payment shall include all labor, tools, equipment and material needed to complete this work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphaltic cement:

1. Viscosity Graded original, AC-10, conforming to requirements of ASTM D-3381 (AASHTO M-226, Table 2), and Section 704.03 - State of Utah Standard Specifications for Road and Bridge Construction.

2. Shall not foam when heated to 350° F.

B. Mineral aggregate:

1. Shall consist of crushed stone, crushed gravel, or crushed slag, or a combination thereof; free of clay, silt, organic matter or other deleterious materials.

2. Gradation shall be in accordance with the following:

a. Asphaltic concrete surface course:

Sieve Size	Percent Passing by Weight
1/2"	100
#4	55 - 85
#16	24 - 38
#50	9 - 21
#200	4 - 8

b. Asphaltic concrete base course:

Sieve Size	Percent Passing by Weight
3/4"	100
3/8"	75 - 91
#4	60 - 80
#16	28 - 48
#50	11 - 23
#200	5 - 9

3. Course aggregate, retained on the No. 4 sieve shall consist of clean, hard, rough, durable and sound fragments, with not less than 50 percent of particles by weight with at least one mechanically fractured face or clean angular face.

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 ASTM D-424.

6. The weight of minus 200 mesh 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. That portion of fine aggregate passing the No. 200 sieve shall be determined by washing with water in accordance with ASTM C-117.

7. The aggregate shall be of uniform density and quality and shall have a rodded weight of not less than 100 pounds per cubic foot when tested in accordance with ASTM C-29.

8. The aggregate shall have a percentage of wear not exceeding forty when tested in accordance with ASTM C-131 and C-535.

9. The aggregate shall have a weighted loss not exceeding 12 percent by weight when subject to five cycles of sodium sulfate and tested in accordance with ASTM C-88, D-1073, and D-692.

2.02 ASPHALTIC CONCRETE PAVING MIXTURE

A. Combine mineral constituents and asphalt cement in proportions per mix design at a central plant to produce an asphaltic concrete pavement mix.

B. The asphaltic cement shall be heated at the mixing plant to a temperature at which it can be applied uniformly to the aggregate.

C. Coarse and fine aggregate shall be stored separately at the mixing plant in a manner that will prevent intermingling.

D. When it is necessary to blend aggregates from one or more sources to produce the combined gradation, each source or size of aggregate shall be stockpiled individually. Aggregate from the individual stockpiles shall be fed through separate bins to the cold elevator feeders. They shall not be blended in the stockpile.

E. Cold aggregates shall be fed carefully to the plant so that surpluses and shortages will not occur and cause breaks in the continuous operation.

F. The aggregate shall be dried and heated to provide a paving mixture temperature in conformance with placing conditions, but not to exceed 163°C (325°F).

G. The heated and dried aggregates shall not contain enough moisture to cause the mixture to slump, the asphalt to foam, or the aggregate to segregate during hauling and placing.

H. The shortest mixing time consistent with satisfactory coating of the aggregate shall be used. The mineral aggregate shall be considered satisfactorily coated with asphaltic cement when all of the particles passing the No. 4 sieve and 96 percent of the particles retained on the No. 4 sieve are coated with asphaltic cement. The required mixing time, as determined above, shall be in accordance with ASTM D-2489.

I. If a dryer drum mixing process is used, the mineral aggregate shall be considered satisfactorily coated with asphaltic cement when all of the particles passing the No. 4 sieve and 98 percent of the particles retained on the No. 4 sieve are coated with asphaltic cement. The moisture content of the asphaltic cement sampled behind the laydown machine prior to compaction shall not exceed 1 percent by weight.

2.03 TACK COAT

A. Emulsified asphalt CSS-1H or SS-1H.

2.04 SUBGRADE STABILIZING MATERIALS

A. Shall be select aggregate material as specified in Section 02061.

PART 3 EXECUTION

3.01 PREPARATION

A. Proofroll base course surface. Replace wet, spongy, soft, uncompactable or other unsuitable material with new base course material at no additional cost. Finish and compact repaired area as specified in Section 02230 - Base Course.

B. Ensure base course surface is to required elevation. Remove loose material from base course surface.

C. Do not place prime coat or asphaltic concrete paving until base course installation has been approved by the Construction Manager.

3.02 TRANSPORTING THE ASPHALTIC CONCRETE PAVEMENT

A. Transport time from the mixing plant to the job site shall not exceed 1 hour.

B. Hauling truck shall have no direct frame contact with the paver or bear down on the paver during dumping operations.

3.03 TACK COAT

A. Prior to placing pavement, tack coat shall be applied to the vertical edges of concrete and "cold" pavement (over 1/2 hour old) which will be in contact with new pavement. Tack coat shall extend 12 inches onto adjacent base course material. The tack coat shall be carefully applied at a rate of 0.15 gal/SY. Tack coat shall also be applied uniformly at the same rate to the horizontal top surface of each lift of bituminous pavement prior to placing the next lift of bituminous pavement to promote a bond between the two courses of pavement. None of the material shall penetrate into the pavement and for this reason the application should be limited.

B. Prior to applying the material, the surface to be treated shall be swept or flushed free of dust or other foreign material.

C. Protect all surfaces not required to receive tack coat from any inadvertent application.

D. The temperature range of the tack coat at the time of application shall be such that the viscosity will be between 50 and 100 centistokes as determined in accordance with ASTM Designation D-2170.

E. Under no circumstances shall traffic be permitted to travel over the tacked surface. If detours cannot be provided, restrict operation to a width that will permit at least one-way traffic over the remaining portion of the roadbed. If one-way traffic is provided, the traffic shall be controlled in accordance with governing authority.

F. After application of tack coat, sufficient time shall be given to allow for complete separation of asphalt and water before paving operations begin. The tack coat shall be applied on only as many surfaces as will be paved against in the same day.

3.04 PLACEMENT OF ASPHALTIC CONCRETE PAVEMENT

A. Place asphalt pavement to provide a compacted depth as indicated on the plans. Placing the pavement shall be a continuous operation. The machine shall spread mixture and shall strike a finish that is smooth, true to cross section, uniform in density and texture, and free from hollows and other irregularities. If any irregularities occur, they shall be corrected before final compaction of the mixture. The paving machine shall be self-propelled, equipped with hoppers, distributing screws, adjustable screeds and equalizing devices, capable of spreading hot asphaltic concrete paving mixtures without tearing, shoving or gouging, and of producing a finished surface of specified quality. Place inaccessible and small areas by hand.

B. Ensure joints made during paving operations are straight, clean, vertical and free of broken or loose material. Carefully make joints to insure a continuous bond between old and new pavement, or between successive day's work. A continuous bond between adjoining work is required.

C. If more than 1/2 hour elapses between adjacent paving passes, the "cold joint" shall have tack coat applied to the "cold" pavement prior to placing the adjacent pass.

3.05 COMPACTION

A. Roll and compact to specified density before temperature of the mixture drops below 180°F.

B. Compact asphalt paving course to required density, with a steelwheeled tandem roller, steel three-wheeled roller, vibratory roller, or a pneumatic-tired roller, weighing not less than five tons. Start compaction as soon as pavement will bear equipment without checking or undue displacement. Speed of roller shall be slow enough to avoid displacement of hot mixture, and any displacements occurring as a result of changing the direction of the roller, or from any other cause, shall at once be corrected by the use of rakes and of fresh mixture where required. Ensure each pass of roller overlaps previous passes by at least 1/2 of the roller width to ensure smooth surface free of roller marks. Keep roller wheels sufficiently moist so as not to pick up material. Rolling shall continue until roller marks are eliminated and no further compression is possible. The finished compacted pavement shall have a density of 96% minimum, (no test less than 93% of the density determined in accordance with ASTM D-2041), as determined by ASTM D1557.

C. Leave pavement with a uniform, dense surface.

D. Perform hand tamping in areas not accessible to rolling equipment. Thorough compaction must be achieved, and joints between curbs, headers, manholes and similar structures must be effectively sealed.

E. Do not allow vehicular traffic on newly paved areas until surface has cooled to atmospheric temperature.

END OF SECTION

SECTION 02525

NEW CONCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide all equipment, materials, labor, tools, and transportation and other items required to provide and install subgrade preparation, drainage course placement, formwork, and placement and finishing of portland cement concrete curbs, gutters, walks and drive aprons.

B. Protection of newly constructed curbs, gutters, drive aprons and walks.

C. Curing provisions.

1.02 RELATED WORK

A. Section 02230 - Base Course

B. Section 03200 - Concrete Formwork

C. Section 03300 - Cast in Place Concrete

1.03 QUALITY ASSURANCE

A. Use workmen thoroughly trained and experienced in placing and finishing the type of work specified.

B. Comply with applicable federal, state, and local codes and regulation.

C. Comply with hot or cold weather requirements.

D. Concrete work shall be warranted against defects in materials or workmanship for a period of two (2) years, subject to applicable laws and regulations. In no case shall the Work be warranted for less than one (1) year.

1.04 REFERENCES

A. American Concrete Institute (ACI)

1. Manual of Concrete Practice, 1985, Part 2:
   a. ACI 305R-77- Hot Weather Concreting
   b. ACI 306R-78 - Cold Weather Concreting
   c. ACI 318 - Building Code Requirements

B. American Society for Testing and Materials (ASTM)

1. D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction

2. C150 - Portland Cement

3. C33 - Concrete Aggregates

4. C94 - Ready Mixed Concrete

C. American Association of State Highway and Transportation Officials (AASHTO)

D. Federal Standard (FS)

1.05 SUBMITTALS

A. Submit concrete trip tickets to Owner's representative at the time of delivery to the site.

B. Submit mix design in accordance with Section 03300.

C. Submit construction, expansion, and contraction joint layout plan for approval.

D. Submit manufacturers data for all products proposed.

1.06 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

A. **Furnish and Install Concrete Roll Gutter**. Measurement and payment will be based upon the in-place lineal footage of concrete roll gutter installed with 4" of compacted untreated base course. Such payment shall include the costs of compacted road base material, fiber mesh reinforcement, and all labor, materials, tools and equipment needed to complete this work.

1.07 DELIVERY AND HANDLING

A. Ready mixed concrete shall be delivered to the site only in such quantities as are required for immediate use. The maximum allowable time between charging of the material in the mixing drum and final placing shall be not more than ninety (90) minutes when ambient temperatures are below 80° F and not more than sixty (60) minutes when ambient temperatures are above 80° F.

B. Concrete which has reached initial set prior to placement, or retempered concrete is not acceptable, shall not be used in the Work, and shall be promptly removed from the project site.

1.08 PROJECT CONDITIONS

A. Concreting operations shall not be performed when air temperature at the project site falls below 40° F.

B. Concreting operations shall not be performed when air temperature at the project site rises above 105° F.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS AND MIXTURE

A. Shall be in accordance with Section 03300.

B. Cement shall comply with the requirements of ASTM C150, Type II.

C. Coarse Aggregate shall comply with the requirements of ASTM C33 and Section 03300 of these specifications.

D. Fine Aggregate shall comply with the requirements of ASTM C33 and Section 03300 of these specifications.

E. Admixtures shall not be allowed in portland cement concrete with the following exceptions:

1. Air Entraining Admixture shall comply with the requirements of ASTM C260.

F. Concrete curing compound shall comply with ASTM C309, Type II, Class A and shall restrict moisture loss to 0.055 gr./sq.cm when applied at a rate of 200 sq.ft./gal.

G. Mix design shall comply with Section 03300 of these specifications.

2.02 JOINT MATERIALS

A. Filler material shall be pre-formed, non-extruding resilient type conforming to the requirements of ASTM D544 of appropriate thickness to fill joint.

B. Joint sealant shall be polyurethane based, self leveling, one part elastomeric sealant complying with the requirements of FS-TT-S00230 Class A, Type I unless Type II is recommended for the intended application by the sealant manufacturer.

C. Select joint materials of sufficient strength, hardness and durability to withstand stiletto heel traffic without damage or deterioration.

2.03 REINFORCEMENT

A. Reinforcement shall comply with the requirements of Section 03100 of these specifications.

2.04 FORMWORK

A. Formwork shall comply with the requirements of Section 03200 of these specifications.

2.05 EQUIPMENT

A. Equipment for placing concrete shall comply with the requirements of Section 03300 of these specifications.

PART 3 EXECUTION

3.01 PREPARATION

A. Remove all wood scraps, ice, snow, frost and debris from the areas in which concrete will be placed. Concrete shall not be placed on frozen ground or in standing water.

B. Thoroughly clean the areas to ensure proper placement and bonding of concrete.

C. Thoroughly wet the forms (except in freezing weather), or oil them; remove all standing water.

D. Thoroughly clean all transporting and handling equipment.

E. Notify the Owner at least 24 hours before placing concrete.

F. Obtain the Engineer's approval of location of construction, expansion, or control joints prior to the start of concrete placement.

G. Verify that reinforcement is free of loose mill scale, mud, paint, oil, grease, or other materials which may hinder proper bonding of concrete to reinforcement.

3.02 PLACING STEEL REINFORCEMENT

A. Steel reinforcement shall be placed in accordance with the requirements of Section 03100 of these specifications.

3.03 PLACING CONCRETE

A. Concrete shall be placed in accordance with the requirements of Section 03300 of these specifications.

3.04 CURB AND GUTTER AND SIDEWALK JOINTS

A. Make all joints perpendicular and straight.

B. Joints for existing structures or paving removed or damaged as a result of the Work shall be replaced, matching joints in original structure as closely as possible.

C. Expansion Joints

1. Expansion joints in sidewalks shall be one half inch (½") in thickness and shall be placed where sidewalk joins existing walks, fixed objects, and at curbs at all handicap ramps using premolded expansion joint filler. Expansion joints shall not be spaced greater than 50' on center. Dowel bars are not required at expansion joints unless indicated on the drawings.

2. Expansion joints in curb and gutter shall be one half inch (½") in thickness and shall be placed between curb and gutter and storm drain structures, at changes in direction, or at intervals not exceeding 50' using premolded expansion joint filler.

3. Joint sealant shall be installed over all expansion joints. Provide and install bond breaker per the manufacturer's recommendations.

D. Contraction Joints

1. Curb and Gutter and Sidewalk

a. Contraction joints shall be installed according to the approved joint plan using steel templates not less than 1/8" nor more than 3/16" in thickness.
b. Remove steel templates once concrete has reached initial set.
c. Curb and gutter placed by slipform methods shall have joints installed every 10' by cutting into fresh concrete to a depth not less than 1-1/2". Round such joints to provide a neat workmanlike appearance.

E. Inspect joints upon removal of forms to verify that concrete or mortar has not sealed across the joint. Cut neatly and remove any such concrete or mortar in the joint.

3.05 HOT WEATHER CONCRETING

A. Hot weather concreting shall be performed in accordance with Section 03300 of these specifications.

3.06 COLD WEATHER CONCRETING

A. Cold weather concreting shall be performed in accordance with Section 03300 of these specifications.

3.07 FINISHING

A. Concrete surfaces shall be finished smooth and true to grade by float. The finishing shall commence immediately after the concrete is placed and shall progress at a rate equal to the paving operation. Any delay in excess of thirty minutes in performing the preliminary finishing shall constitute cause for shutting down the mixing operations until the finishing is resumed.

B. Hand methods of strike off and consolidation will only be permitted when the width of pavement to be constructed is less than 10 feet or at rounded intersection where the use of machine finishing is impractical.

C. While the concrete is still plastic the entire slab surface shall be tested by the Contractor for trueness with an accurate 10 foot straightedge. Any depressions found shall be immediately filled with fresh concrete, struck off, reconsolidated, and finished. High spots shall be struck off and refinished.

D. In advance of curing operations the pavement shall be textured by brooming. Owner shall be notified 24 hours in advance of placing and brooming operations in order to be present to review and recommend modifications to placement and finishing.

E. Finished Surface

1. The finished surface shall be true to grade and cross section, free from ruts, humps, depressions or other irregularities. The surface shall not deviate from line and grade by more than 1/8" in 10'. The determination of compliance with smoothness may be made with a straightedge or string line at the option of the Engineer. Any irregularities found shall be corrected by the Contractor using suitable grinding or grooving tools and equipment.

2. The grinding tool shall consist of a machine equipped with cutting wheels mounted on a horizontal shaft. The grinding action shall be conducted parallel to the centerline.Grinding operations may be deferred, as directed by the Engineer, whenever tearing of aggregate with the surface occurs and shall not be resumed until the concrete has hardened sufficiently to avoid tearing.

3. The finished surface across contact joints shall not deviate from a straight line by more than 1/8" in 12" when tested with a straightedge. The Contractor shall take the necessary precautions to prevent slumping of the edge of the concrete at contact joints.

4. Line and Grade Control:
   a. Contractor shall establish references at suitable intervals for line and grade control of the placing operations.
   f. Contractor shall furnish, place and maintain such supports, wire devices and materials that may be required to provide continuous line and grade reference controls to the placing machine, trimmers, or paver.

3.07 CURING

A. Protect placed concrete from the effects of hot or cold weather as required under Section 03300 of these specifications.

B. Membrane Curing Compound

1. Surfaces of newly placed or exposed concrete shall be kept moist or wet until the curing compound is applied. The curing compound shall be applied immediately after all patching or surface finishing has been completed.

2. The curing compound shall be delivered to the work in ready mixed form. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. The compound shall not be diluted or altered in any manner.

3. Curing compound that has become chilled to such an extent that it is too viscous for satisfactory application shall be warmed to a temperature not exceeding 100° F, unless otherwise specified by the manufacturer's recommendations.

4. The curing compound shall be applied to the exposed surface at a uniform rate of 1 gallon per 100 square feet, unless otherwise specified by the manufacturer's recommendations.

5. In the event that the application of curing compound is delayed, the application of water spray, ponding, or soaked tarps shall be started immediately and shall be continued until application of the compound is started or resumed.

3.08 PROTECTION

A. Contractor shall protect the concrete against all damage and markings.

B. Erect and maintain suitable barricades and barriers to protect the finished surface. Any sections damaged from traffic or other causes prior to final acceptance shall be removed, replaced, or repaired to the Owner's satisfaction at no additional expense to the Owner.

C. Concrete surface shall be protected against pitting or damage due to rain.

END OF SECTION

SECTION 02763

PAVEMENT MARKING AND SIGNING

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
1.Furnish material and apply pavement and curb markings as described in Contract Documents.

1.2 QUALITY ASSURANCE

A. Regulatory Requirements - Paint handicap spaces to conform to ADA Standards and local code requirements.

1.3 PROJECT/SITE CONDITIONS

A. Environmental Requirements
1. Apply only on dry surfaces and during favorable weather, and when damage by rain, fog, or condensation not anticipated.

1.4 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

A. **Furnish and Install Paint Striping and Signing**. No measurement will be made and payment will be based upon the lump sum item amount. Such payment shall include the costs for furnishing and installing 2 coats of paint striping and signing in accordance with all requirements listed in the plans. Such payment shall include the costs of all posts, bases, materials, labor, equipment, fees, etc to complete this work.

PART 2 PRODUCTS

2.1 MATERIAL

A. Paint
1. Non-reflectorized.
2.Types-
a. Acrylic Latex for uncured paving
] b. Alkyd or chlorinted rubber for cured paving

PART 3 EXECUTION

3.1 PREPARATION

A. Contractor may apply paint striping immediately after installation and compaction of asphalt.

B.Surfaces shall be fully vacuumed swept and dry and free of grease and loose dirt particles. Scrape and wire brush chipped or damaged paint on existing curbs.

C. Perform layout with chalk or lumber crayon only.

3.2 APPLICATION

A. Site Tolerances

1. General - Make lines parallel, evenly spaced, and with sharply defined edges.

2.Line Widths -

a. Plus or minus 1/4 inch variance on straight segments.

b. Plus or minus 1/2 inch variance on curved alignments.

B. Provide two coat application.

3.3 CLEANING

A. Remove drips, overspray, improper markings, and paint material tracked by traffic by sand blasting, wire brushing, or other method approved by Engineer prior to performance.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 WORK INCLUDED

A. Concrete formwork for on-site cast-in-place concrete waterway, or other improvements removed or damaged during the work.

1.02 RELATED WORK

A. Section 02525 - Concrete Waterways

B. Section 03200 - Concrete Reinforcement

C. Section 03300 - Cast-In-Place Concrete

1.03 QUALITY ASSURANCE

A. Comply with federal, state, and/or local codes and regulations.

B. All work shall be performed by experienced and qualified workmen.

1.04 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

A. No measurement will be made.

B. Payment will be included in the lump sum contract amount.

PART 2 PRODUCTS

2.01 UTILITY STRUCTURE FORM MATERIALS

A. Forms shall be of suitable material and of a type, size, shape, quality, and strength to insure construction as designed.

B. Metal forms for exposed surfaces may be used when all bolt and rivet holes are countersunk so that a plane, smooth surface of the desired contour is obtained.

C. Rough lumber may be used for forming surfaces that will be covered by earth in the finished structure.

D. Forms for all surfaces that will not be completely enclosed or hidden below the permanent surface of the ground shall be made of surfaced lumber, or material which will provide a surface at least equal to surfaced lumber or plywood.

E. All lumber shall be free from knotholes, loose knots, cracks, splits, warps, or other defects affecting the strength or appearance of the finished structure. Any lumber or material which becomes badly checked or warped, prior to placing concrete, shall not be used.

PART 3 EXECUTION

3.01 PREPARATION

A. All forms shall be free of bulge and warp, and shall be cleaned thoroughly before being used.

3.02 FORM CONSTRUCTION

A. Forms shall be so constructed that the finished concrete shall be of the form and dimensions shown on the plans and true to line and grade, and sufficiently rigid to resist deflection. Design of formwork and removal of forms and shores are to conform to ACI 318. The responsibility for their adequacy shall rest with the contractor.

B. All forms shall be mortar tight and so designed and constructed that they may be removed without injuring the concrete.

C. If, at any stage of the work, during or after placing the concrete, the forms sag or bulge to such an extent as to allow concrete to fall below the elevation shown on the plans, or outside the true line of the form, the concrete affected shall be removed.

D. No concrete may be deposited against the earth as a side form.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 WORK INCLUDED

A. Placing of concrete reinforcing for cast-in-place concrete water, sanitary sewage and storm sewage system structures.

1.02 RELATED WORK

A. Section 03100 - Concrete Formwork

B. Section 03300 - Cast-In-Place Concrete

1.03 QUALITY ASSURANCE

A. Comply with federal, state, and/or local codes and regulations.

B. All work shall be performed by experienced and qualified workmen.

1.04 REFERENCES

A. "Manual of Standard Practices", Concrete Reinforcing Steel Institute (CRSI)

B. American Society for Testing and Materials (ASTM):
   1. A-615, "Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"

1.05 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. No measurement will be made.

B. Payment will be included in the lump sum contract amount.

PART 2 PRODUCTS

2.01 STEEL MATERIALS

A. Reinforcing steel:
   1. All reinforcing bar material used for reinforcement of concrete shall be intermediate Grade 60 steel conforming to the requirements of ASTM A-615.
   2. All rods shall be deformed and round.
   3. All reinforcement shall be uncoated, free from rust, scale, form oil, etc.
   4. Welded wire fabric for concrete reinforcement shall conform to ASTM A-185.

B. Accessories:
   1. All accessories, including such items as chairs, spacers, saddles, etc., shall be of steel formed in such a manner and with sufficient strength to perform

the intended functions. Chairs, spacers, saddles, etc., which are set in contact with forms, are to be galvanized or provided with plastic tips or coating to prevent rust spots on finish concrete surface.

C. Wire:
1. All tying steel shall not be less than 18 gage annealed iron lacing wire. All wire tie ends shall point away from forms.

PART 3 EXECUTION

3.01 PREPARATION

A. All reinforcement shall be free from loose mill scale, loose or thick rust, dirt, paint, oil, or grease, and shall present a clean surface.

3.02 PLACING STEEL REINFORCEMENT

A. Reinforcing bars shall be accurately placed as shown on the plans and shall be firmly and securely held in position in accordance with the "Manual of Standard Practice" of the Concrete Reinforcing Steel Institute, using concrete or metal chairs, spacers, metal hangers, supporting wires and other appropriate devices of sufficient strength to resist crushing under full load. Metal chairs which extend to the surface of the concrete (except where shown on the plans) and wooden supports, shall not be used.

B. Placing bars on layers of fresh concrete as the work progresses and adjusting bars during the placing of concrete will not be permitted.

C. Tack welding of reinforcing bars in place shall not be allowed.

D. Splicing:
1. Splices of bars shall be made only where shown on the Drawings or as approved by the Owner.
2. Where bars are spliced, they shall be lapped at least 30 diameters, unless otherwise shown on the plans.
3. Splicing shall be accomplished by placing the bars in contact with each other and wiring them together.

E. Bending reinforcement:
1. Bends and hooks in bars shall be made in the manner prescribed in the "Manual of Standard Practice" of the Concrete Reinforcing Steel Institute.
2. Bars shall not be bent or straightened in a manner which will injure the material.
3. Bars with kinks or unspecified bends shall not be used.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Inspection

B. Preparation

C. Placing Concrete

D. Hot Weather Concreting

E. Cold Weather Concreting

F. Expansion, Contraction and Construction Joints

G. Finishing

H. Curing

I. Field Quality Control

J. Protection

1.02 RELATED WORK

A. Section 03100 - Concrete Formwork

B. Section 03200 - Concrete Reinforcement

1.03 QUALITY ASSURANCE

A. Qualifications of Workmen:
   1. Use workmen thoroughly trained and experienced in placing and finishing the types of concrete specified.

B. Comply with federal, state and local codes and regulations.

C. Comply with hot or cold weather requirements as applicable.

1.04 REFERENCES

A. The American Concrete Institute (ACI):
   1. 306R, "Cold Weather Concreting"
   2. 305R, "Hot Weather Concreting"
   3. 318-83, "Building Code Requirements"

B. American Society for Testing and Materials (ASTM):

1. C-150, "Portland Cement"
2. C-33, "Concrete Aggregates"
3. C-94, "Ready-Mixed Concrete"

1.05 SUBMITTALS

A. A mix design and information based on trial batch test results shall be submitted to Owner at least two weeks prior to commencement of the work.

B. Results from a reputable independent testing laboratory showing concrete aggregates comply with applicable sections of ASTM C-33. Contractor shall pay for necessary tests as directed by Engineer. A minimum of one test shall be made on the aggregate used for the first 5 cubic yards of concrete and for each 50 cubic yards thereafter. Should the Engineer deem that additional testing of aggregate is necessary, he may select samples from any of the aggregate to be used and have these samples tested by a recognized laboratory of his choice. Such material shall not be used in the work until the test reports are available. Should the material fail to meet the specified requirements, the aggregate will be rejected and the expense of testing shall be borne by the Contractor. Should the tests show the aggregate to be satisfactory, the cost of additional testing will be borne by the Owner.

D. Submit manufacturer's information (catalog data) for all products.

1.06 DELIVERY, STORAGE AND HANDLING

A. Ready-mixed concrete: Concrete shall be mixed only in such quantities as are required for immediate use. The maximum allowable time between charging of the material in the mixing drum and final placing shall be ninety minutes for air temperatures below 80` F and sixty minutes for temperatures above 80` F. Concrete not placed within these time limits, or if an initial set has developed shall not be used. Tempering concrete by adding water or by other means will not be permitted.

B. Materials shall be delivered, stored, and handled so as to prevent damage by water or inclusion of foreign materials. Packaged materials shall be delivered and stored in original package, marked with brand and maker's name, until ready for use. Packages of materials showing evidence of water or other damage shall be rejected. Bulk cement shall be identified by shipping and delivery statements.

C. Cement shall not be stored longer than 4 months before usage.

1.07 WARRANTY

A. Shall be for two (2) years in accordance with applicable laws and regulation. See General Conditions.

1.08 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

A. No measurement will be made.

B. Payment will be included in the lump sum contract amount.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement:
1. Portland cement shall be Type II, low alkali, complying with ASTM C-150, unless otherwise specified.
2. Air-entrainment of cement is required.

B. Coarse Aggregates:
1. Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, air-cooled blast furnace slag, or crushed hydraulic-cement concrete, or a combination thereof, conforming to the requirements of ASTM C-33.
2. The amount of deleterious substances included in the aggregate shall not exceed the amount specified in ASTM C33.
3. Coarse aggregate size shall be graded within the following limits.

Coarse Aggregate Size (Nominal)	Percent Passing (by weight)					
	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4
3/4"	100	95-100	-	25-60	-	0-10

C. Fine aggregate:
1. Fine aggregate shall consist of natural sand, manufactured sand, or a combination thereof, conforming to the requirements of ASTM C-33.
2. Shall not be used in the work until approval by the Engineer of the tests performed by the independent testing laboratory.
3. The amount of deleterious substances included in the aggregate shall not exceed the amount specified in ASTM C33.
4. Fine aggregate shall be uniformly graded from coarse to fine within the following gradation:

Sieve Size	Percent Passing (by weight)
3/8"	100
No. 4	95-100
No. 16	45-80
No. 50	10-30
No. 100	2-10

D. Water:
1. Water used in washing aggregate and mixing concrete shall be of a potable quality clean and free from oil, acid, salt, injurious amounts of alkali, organic matter or other deleterious substances.

E. Admixtures:
1. The air-entraining admixture shall conform to ASTM Designation C-260 and be added at the mixer, not the job site.
2. Flyash shall NOT be used in concrete.
3. Use Pro Mesh Fiber Mesh additive in concrete or approved equal. Follow manufacturer's recommendations. Add approximately 1.5 pounds of additive per cubic yard of mix. Mix well and wait for a minimum of 5 minutes before placing.
4. No other admixtures will be allowed unless approved by the Engineer.

F. Concrete curing compound:
   1. Liquid membrane curing compound shall conform to all applicable sections of ASTM C-309.

2.02 CONCRETE MIX

A. Concrete shall consist of a mixture of Portland Cement, water, fine and coarse aggregates, and an air entraining agent.

B. The proportions of the concrete materials shall produce a mixture that will work readily into corners and angles of forms and around reinforcing steel. The mixture shall have a water content which does not exceed the maximum specified amount, and which shall have the required compressive strength.

C. The methods of measuring concrete materials shall permit proportions to be accurately controlled and easily checked. Measurement of materials for ready-mixed concrete shall conform to ASTM C-94. Engineer shall have free access to the mixing plant at all times.

D. Concrete mix shall be as follows (unless otherwise shown or specified). The proportions given below are intended to give the required strength and shall be carefully followed as to minimum quantity of cement per cubic yard of concrete and as to water/cement ratios and more cement per cubic yare of concrete will be required if tests indicate necessity for such increased quantity to achieve the design strength:

Intended Use	Coarse Aggregate Size (-inches)	Min. Cement Content (sacks/CY)	Min. 28-Day Compressive Strength (psi)	Min. 14-Day Flexural Strength (psi)	Slump (inches)	Air Entrainment (percent)	Max. Water/ Cement Ratio
Concrete Pavement, Storm Drain Inlet Boxes, Curbs & Walks	3/4	6.5	4000	550	2.5-4.0	6.5 +/- 1%	0.45

2.04 EQUIPMENT

A. Mixing equipment shall be subject to approval. Mixers may be of the stationary plant, paver, or truck mixer type.

B. Each mixer shall be equipped with a device for accurately measuring and indicating the quantity of water entering the concrete, and the operating mechanism shall be such that leakage will not occur when the valves are closed.

C. Adequate equipment and facilities shall be provided for accurate measurement and control of all materials, and for readily changing the proportions of the material. The batch plant shall be capable of controlling the delivery of all material to within 1% by weight of the individual material. If bulk cement is used, it shall be weighed on a separate visible scale which will accurately register the scale load at any stage of the weighing operation from zero to full capacity.

D. Mixers shall be equipped with a device for automatically measuring and indicating the time required for mixing, which device shall be interlocked to prevent the discharge of concrete from the mixer before the expiration of the mixing period. Neither speed nor volume capacity of the mixers shall exceed manufacturer's

recommendations. Excessive over-mixing, requiring additions of water to preserve the required consistency, will not be permitted.

PART 3 EXECUTION

3.01 INSPECTION

A. Inspect subgrade surface and verify grade and adequacy of compaction.

B. Correct grade and compaction deficiencies.

C. Notify the Engineer in writing of readiness to place concrete in any portion of the work, This notification shall be given as far in advance of the placing of concrete as the Engineer deems necessary for him to make final inspection of the preparations at the location of the proposed concrete placing. All forms, steel, screeds, anchors, ties, and inserts shall be in place before the Contractor's notification of readiness is given to the Engineer.

D. No concrete shall be placed until forms, reinforcement, etc. has been inspected by the Engineer.

3.02 PREPARATION

A. Remove all water, wood scraps, ice, snow, frost and debris from the areas in which concrete will be placed.

B. Thoroughly clean the areas to ensure proper placement and bonding of concrete.

C. Thoroughly dampen the surfaces which will come into contact with the concrete (except in freezing weather), forms may be oiled instead; remove all standing water. Reinforcement shall be thoroughly cleaned of all ice and other coatings.

D. Thoroughly clean all transporting and handling equipment.

E. Erect and maintain suitable barriers to protect the finished surface. Any section damaged from traffic or other causes occurring prior to its official acceptance, shall be repaired or replaced by the Contractor at his own expenxe in a manner satisfactory to the Owner.

F. The concrete surface must not be damaged or pitted by rain, hail or snow.

G. Concrete shall not be placed until all reinforcement is securely and properly fastened in its correct position, and until the form ties at construction joints have been retightened, all sleeves, hangers, pipe, bolts and any other items required to be embedded in the concrete have been placed and anchored and the forms cleaned and coated as specified.

3.03 PLACING CONCRETE

A. Except by specific written authorization, concreting operations shall not be continued when a descending air temperature, in the shade and away from artificial heat, falls below 40 F, nor shall operations be resumed until ascending air temperature, in the shade and away from artificial heat, reaches 35 F.

B. Convey concrete from mixer to place of final deposit by methods that will prevent separation and loss of materials.
   1. The free fall of concrete from the end of the spout or chute, or from a transporting vehicle, shall not exceed 6 feet, except when beginning a wall pour, in which case the free fall shall not exceed 2 feet.
   2. When the distance through which concrete must be dropped vertically exceeds the maximums specified above, a tremie or flexible metal spout shall be used. Flexible metal spouts having sufficient strength to hold the weight of the concrete shall be composed of conical sections not nore than 3 feet long, with the diameter of the outlet and taper of the various sections such that the concrete will fill the outlet and be retarded in its flow.
   3. Chutes, troughs, or pipes used as aids in placing concrete shall be arranged and used so that the ingredients of the concrete will not be separated. Chutes and troughs shall be of metal or metal-lined. When steep slopes are necessary, the chutes shall be equipped with baffle boards or a reversed section at the outlet. Open troughs and chutes shall extend, if necessary, down inside the forms or through holes left in the forms; or the ends of such chutes shall terminate in vertical downspouts,
   4. Pumping: The equipment shall be so arranged that no vibrations result which might damage freshly placed concrete. Where concrete is conveyed and placed by mechanically applied pressure, the equipment shall be suitable in kind and adequate in capacity for the work. The operation of the pump shall be such that a continuous stream of concrete without air pockets is produced. When pumping is completed, the concrete remaining in the pipe line, if it is to be used, shall be ejected in such a manner that there will be no contamination of the concrete or separation of the ingredients. Before and after this operation, the entire equipment shall be thoroughly cleaned. Water shall not be added to the concrete in the pump hopper.

C. Place concrete as dry as possible consistent with good workmanship, never exceeding the maximum specified slump.

D. Place concrete at such a rate that concrete is at all times plastic and flows readily between bare bars. No segregation of coarse aggregate shall occur when placing or dropping between bars.

E. When placing is once started, carry it on as a continuous operation until placement of the section is complete.

F. Do not pour a greater area at one time than can be properly finished without checking; this is particularly important during hot or dry weather.

G. Do not use retempered concrete that has been contaminated by foreign materials.

H. Struts, stays, and braces serving temporarily to hold the forms in correct shape and alignment, pending the placing of concrete at their locations, shall be removed when the concrete placing has reached the elevation and strength rendering their service unnecessary. These temporary members shall be entirely removed from the forms.

I. Build into concrete any nosings, inserts, anchors, structural members, ties and hangers required to secure abutting or adjacent materials. Waterstops shall be prevented from bending over or being moved out of position.

J. Unless necessary materials and equipment are readily available to adequately protect the concrete in place, placing operations may be postponed by the Engineer when, in the opinion of the Engineer, impending conditions may result in rainfall or low temperatures which will impair the quality of the finished work. The Contractor shall pay for all delay related costs resulting from such postponements including costs for removing and replacing damaged concrete. In case rainfall should occur after placing operations are started, provide ample covering to protect the work.

K. Whenever it is necessary to continue the mixing, placing, and finishing of concrete after daylight hours, the site of the work shall be adequately lighted so that all operations are plainly visible. Every effort shall be made to enable finishing to be done in daylight.

L. Clean up all spilled concrete and washings thoroughly. Concrete trucks shall not be washed-out on job site. Wash trucks at off-site location in accordance with all applicable laws and ordinances.

3.04 HOT WEATHER CONCRETING

A. Hot weather is defined as any combination of high air temperature, low relative humidity, and wind velocity tending to impair the quality of fresh or hardened concrete or otherwise resulting in

abnormal properties. Hot weather concreting shall follow the guidelines of ACI 305R, latest edition.

B. Undesirable hot weather effects on concrete in the plastic state may include:
1. Increased water demand.
2. Increased rate of slump loss and corresponding tendency to add water at job site.
3. Increased rate of setting resulting in greater difficulty with handling, finishing, and curing, and increasing the possibility of cold joints.
4. Increased tendency for plastic cracking.
5. Increased difficulty in controlling entrained air content.

C. Undesirable hot weather effects on concrete in the hardened state may include:
1. Decreased strength resulting from higher water demand and increased temperature level.
2. Increased tendency for drying shrinkage and differential thermal cracking.
3. Decreased durability.
4. Decreased uniformity of surface appearance.

D. Placing and curing:
1. Concrete shall be handled and transported with a minimum of segregation and slump loss. Concrete temperature at time of placement shall be such that the rate of evaporation for the weather conditions shall not cause cracking.
2. The aggregate shall be cooled by frequent spraying in such a manner as to utilize the cooling effect of evaporation. The placement schedule shall be arranged, as approved, in such a manner as to provide time for the temperature of the previously placed course to begin to recede. The mixing water shall be the coolest available at the site insofar as is practicable.
3. Concrete shall be placed where it is to remain.

4. Concrete shall be placed in layers shallow enough to assure vibration well into the layer below.
5. Surfaces exposed to the drying wind shall be covered up immediately after finishing with polyethylene sheets and be water cured continuously as soon as the concrete has set up. Curing compounds, in lieu of water, may not be used.
6. Joints shall be made on sound, clean concrete.
7. Finishing operations and their timing shall be guided only by the readiness of the concrete for them, and nothing else.
8. Curing shall be conducted in such a manner that at no time during the prescribed period will the concrete lack ample moisture and temperature control. Facilities must be ready to protect promptly all exposed surfaces from drying. All work determined by Engineer to be damaged from hot weather shall be removed and replaced at no cost to Owner.
9. All materials and workmanship required to meet the hot weather requirements shall be supplied at the Contractor's own expense.

3.05 COLD WEATHER CONCRETING

A. Cold weather is generally defined as a period when for more than 3 successive days the mean daily temperature drops below 40 F. When temperatures above 50 F occur during more than half of any 24-hour period, the weather should no longer be regarded as "cold". The times and temperatures given for various conditions and situations are not exact values and should not be used as such. Weather conditions are variable and common sense must be used to protect the concrete. Cold weather concreting shall follow the guidelines of ACI 306R, latest edition.

B. All materials and workmanship required to meet the cold weather requirements shall be supplied at the Contractor's own expense.
   1. Preparation:
      a. When specific written authorization is given to permit concreting operations at temperatures below those specified in 3.03 PLACING CONCRETE, arrangements for covering, insulating, housing, or heating materials and/or newly placed concrete should be made in advance of placement and should be adequate to achieve the temperature and moisture conditions recommended herein in all parts of the concrete. All equipment and materials necessary should be at the work site before the first frosts are likely to occur, not after concrete has been placed and its temperature begins to approach the freezing point.
   2. Placement and protection:
      a. During placement of concrete, tarpaulins, or other readily movable coverings supported on horses or framework should follow closely the placing of the concrete so that only a few feet of concrete are exposed to outside air at any time.
      b. The housing, covering, or other protection used in curing shall remain intact at least 24 hours after artificial heating is discontinued.
      c. All concrete placed in forms shall have a temperature between 55` and 90` after placement. Adequate means shall be provided for maintaining the surrounding air at 60 F for at least seventy-two hours after placing and at no less than 40 F for an additional four days. All methods and equipment for heating shall be subject to approval. Insulating blankets shall be used when required to maintain a satisfactory temperature during the curing period.

d. No dependence shall be placed on salt or other chemicals for the prevention of freezing.

e. If heating or other protective measures need to be taken to prevent concrete from freezing, the concrete may require special curing methods to prevent rapid drying, as described in ACI 306R-78.

3.06 EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS

A. Shall be formed and sealed as shown on the drawings or as required in individual Specifications Sections.

3.07 FINISHING

A. Surface preparation: Immediately after the removal of forms, all fins and irregular projections shall be removed from surfaces, whether or not they are to be covered with high tensile wire and shotcrete covercoats.

B. The finishing shall commence immediately after the concrete is placed. Any delay in excess of thirty minutes in performing the preliminary finishing shall constitute cause for shutting down the placing operation.

C. The finished surface shall be true to grade and cross section, free from ruts, humps, depression or other irregularities.

D. Finish Types: Finish shall be as shown on the Drawings or as specified in individual specification sections in accordance with the following:

1. Patched: Remove all fins and irregular projections. Clean form-tie holes thoroughly, coat with suitable epoxy and fill with mortar of dry consistency (see PART 2 - PRODUCTS).
2. Rubbed: Use proper grout mix (see PART 2 - PRODUCTS) and point up voids with cement mortar. Thereafter, rub the entire surface with said grout mix and a carborundum stone to produce a relatively smooth, plane surface without defects and imperfections. Surface shall be properly cured. Use of plaster shall not be permitted. Upon completion of the rubbing, the surface shall be washed thoroughly with clean water.
3. Float: This type of finish shall be an integral finish by float after screeding, to compact the surface evenly. Any excess surface water shall be removed before floating and no mortar shall be used for leveling.
4. Steel Trowel: After striking off the wearing course to the established grade, it shall be compacted by rolling or tamping, and then floated with a wood or magnesium float or power floating machine. The surface shall be tested with a straightedge to detect high and low spots, which shall be eliminated. Floating shall be followed by steel troweling after the concrete has hardened sufficiently to prevent excess fine material from working to the surface. The finish shall be brought to a smooth surface, free from defects and blemishes. No dry cement nor mixture of dry cement and sand shall be sprinkled directly on the surface of the wearing course to absorb moisture or to stiffen the mix. After the concrete has further hardened, additional troweling may be required. This shall be done as may be directed by the Engineer. Trowling shall produce a dense, smooth, impervious surface, free from defects and blemishes.
5. Sandblasting: Sandblasting shall be done using a sharp silica sand. Exterior surfaces of concrete walls shall be sandblasted with #16 silica sand, preferably by the dry sandblasting process before wire wrapping may

be started. The concrete surface shall be heavily pitted, leaving no traces of laitance, form-oil and original surface smoothness and surface color. The minimum sand consumption per 100 square feet of surface shall be 150 pounds of silica sand. Sandblasting shall not be started before the completion date of the curing period or before all tieholes have been dry-packed.

6. Formed: Immediately after the removal of forms, all fins and irregular projections shall be removed from surfaces, whether or not they are to be covered with high tensile wire and shotcrete covercoats.

E. Final finishing:
   1. When the concrete has hardened sufficiently, the surface shall be given a broom finish. The broom shall be of an approved type.
   2. The strokes shall be in a transverse direction with adjacent strokes slightly overlapped and shall be made by drawing the broom without tearing the concrete, but so as to produce regular corrugations not over 1/8 inch in depth.
   3. The surface, as thus finished, shall be free from porous spots, irregularities, depressions, and small pockets or rough spots such as may be caused by accidental disturbing during the final brooming of particles of course aggregate embedded near the surface.

3.09 CURING

A. Protect the concrete from the effects of weather in accordance with HOT WEATHER CONCRETING AND COLD WEATHER CONCRETING in this section.

B. Water for curing shall be as specified in PART 2 - PRODUCTS.

C. Other curing requirements may be required in individual Specifications Sections.

D. Membrane curing compound method:
   1. Surface of newly placed or exposed concrete shall be kept moist or wet until the curing compound is applied. The curing compound shall be applied immediately after all patching or surface finishing has been completed.
   2. The curing compound shall be delivered to the work in ready-mixed form. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. The compound shall not be diluted or altered in any manner.

   3. Curing compound that has become chilled to such an extent that it is too viscous for satisfactory application shall be warmed to a temperature not exceeding 100` F, unless otherwise specified by manufacturer's recommendations.
   4. The curing compound shall be applied to the exposed surface at a uniform rate of 1 gallon per 150 square feet of area, unless otherwise required by manufacturer's recommendations.
   5. In the event that the application of curing compound is delayed, the application of water as provided in this section shall be started immediately and shall be continued until application of the compound is resumed or started.

3.10 FIELD QUALITY CONTROL

A. Testing will be provided by a testing laboratory employed by the Owner. The Engineer shall select the testing agency from Owner's list of approved labs. Refer to individual Specifications Sections for other Field Quality Control requirements.

B. All testing will be paid for by Owner, except for retesting of material which fails to meet these specifications. Such retesting shall be paid for by Contractor at no expense to Owner. Contractor shall pay for curing cylinders. Testing agency shall transport cylinders.

C. Concrete sampled from a concrete pump shall be sampled from the hose after all of the priming grout has been wasted. The end of the hose shall be placed in a horizontal position before the concrete is discharged into the sampling pan. The concrete shall not be allowed to fall into the sampling pan.

D. The Contractor, at his expense, shall furnish the concrete required for testing.

E. Strength, slump and air tests shall be taken in accordance with the following unless otherwise specified in individual Specifications Sections:

1. Strength, slump and air tests may be taken in accordance with the placement rate per day as shown below:

Rate/Day (C.Y.)	Air	Slump	Compress. Strength	Flexural Strength
0-8	1	1	Optional	Optional
8-50	1	1	1	1
For each 50 C.Y. or fraction thereof	1	1	1	1

Additional tests may be made at the discretion of the Owner.

2. Compressive strength test specimens shall be made and cured in accordance with ASTM C-31; Specimens shall be tested in accordance with ASTM C-39.
   a. Three specimens shall be made by the Engineer for each test, and these shall be broken at 7 and at 28 days, with one held in reserve.
   b. At least one test (3 specimens) shall be made for <u>each class</u> of concrete poured during one day.

3. Flexural strength test specimens shall be prepared in accordance with AASHTO Designation T-23 and tested for flexural strength in accordance with AASHTO Designation T-97.
   a. Four specimens shall be made by the Engineer for each test, and one shall be broken at 7 and two at 14 days, with one held in reserve.
   b. At least one test (4 specimens) shall be made for <u>each class of</u> concrete placed during one day.

4. If a slump test does not meet the specification, a second slump test shall be made immediately on the same load. The concrete shall be accepted if the second slump test meets the specification or rejected and removed from the project if the second slump test does not meet the specification.

5. If an air test does not meet the specification, a second air test shall be made immediately upon the same load. The concrete shall be accepted if the second air test meets the specification or rejected and removed from the project if the second air test does not meet the specification.
6. Slump and air tests shall be made in accordance with ASTM C-143 and C-231, respectively.
7. The maximum allowable time between charging of the material in the mixing drum and final placing shall be ninety minutes for air temperatures below 80 F and sixty minutes for temperatures above 80 F. Concrete not placed within these time limits, or if an initial set has developed shall not be used. Tempering concrete by adding water or by other means will not be permitted.
8. If a compressive strength test is below the required specified strength, the Engineer shall immediately notify the Contractor or his authorized representative.
9. All costs incurred in resampling and retesting shall be paid by the Contractor if the retested strength is below the specified strength, and shall be assumed by the Owner if the retested strength is above the specified strength.

3.11 PROTECTION

A. Comply with applicable parts of Section 03300 for protection of concrete. Also comply with HOT WEATHER CONCRETING and COLD WEATHER CONCRETING requirements specified herein.

B. Provide barricades and enclosures to prevent damage to newly placed concrete.

C. Replace concrete curb, walls and exterior flatwork damaged by construction activities as directed, at no cost to Owner.

D. Every reasonable precaution shall be taken to protect finished surfaces from abrasions or other damage. Concrete surfaces or edges likely to be injured during the construction period shall be protected by leaving the forms in place or by erecting satisfactory covers. No fire shall be permitted in direct contact with concrete at any time. Concrete shall be adequately protected from injurious drying action by sun and wind, and from pitting by rain.

END OF SECTION