



STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

May 24, 2010

TENNIS COURT RESURFACING

WEBER STATE UNIVERSITY

OGDEN, UTAH

DFCM Project Number: 10009810

Caldwell | Richards | Sorensen
2060 East 2100 South
Salt Lake City, UT 84109

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Technical Specifications:
Drawings:

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

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

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

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

NOTICE TO CONTRACTORS

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

WEBER STATE UNIVERSITY
TENNIS COURT RESURFACING
DFCM PROJECT NO: 10009810

Bids will be in accordance with the Contract Documents that will be available on **Monday, May 24, 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 Lucas V. Davis, DFCM, at 801-842-8210. No others are to be contacted regarding this bidding process. The construction estimate for this project is \$380,000.00.

A **mandatory** pre-bid meeting will be held at **10:00am on Tuesday, June 1, 2010** at the Weber State University Tennis Courts located on the corner of 4100 South and Taylor Avenue on the WSU campus in Ogden.. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of **2:00 PM on Monday, June 14, 2010** at DFCM, 4110 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. NOTE: Bids must be received at 4110 State Office Building by the specified time.

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

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

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

PROJECT DESCRIPTION

This project will include the resurfacing and remodel of the existing tennis courts for Weber State University. The court surface will be remodeled by adding a new post-tension concrete slab over the existing playing surface. Additionally it will include a new playing surface, posts, nets, fences, relocation of storage sheds & bleachers on site, constructing a retaining wall and the addition of an ADA ramp from the Swenson Gym to the courts. Please see the drawings and specifications for details of the project.

Please note section 03700, part 1, section 1.2 – Standards as it relates to the qualifications of the contractors for this project. Previous post-tension concrete and tennis court surfacing job experience will be necessary. Qualifications will be due Tuesday, June 8th at 10:00am.

**PROJECT SCHEDULE**

PROJECT NAME: TENNIS COURT RESURFACING – WEBER STATE UNIVERSITY OGDEN, UTAH DFCM PROJECT NO. 10009810				
Event	Day	Date	Time	Place
Bidding Documents Available	Monday	May 24, 2010	9:00 am	DFCM 4110 State Office Bldg SLC, UT and the DFCM web site *
Mandatory Pre-bid Site Meeting	Tuesday	June 1, 2010	10:00 am	Weber State University Tennis Courts 4100 South & Taylor Ave. Ogden, UT
Last Day to Submit Questions	Monday	June 7, 2010	10:00 am	<i>Lucas V. Davis</i> – DFCM lucasdavis@utah.gov Fax 801-538-3267
Contractors Turn In Qualifications	Tuesday	June 8, 2010	10:00 am	DFCM 4110 State Office Bldg SLC, UT
Addendum Deadline (exception for bid delays)	Thursday	June 10, 2010	2:00 pm	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Monday	June 14, 2010	2:00 pm	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Tuesday	June 15, 2010	2:00 pm	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Wednesday	September 1, 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 Tennis Court Resurfacing – Weber State University – Ogden, Utah – DFCM Project No. 10009810 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: _____

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 September 1st, 2010, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **\$750** 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 100% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization:

(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

Respectfully submitted,

Name of Bidder

ADDRESS:

Authorized Signature

INSTRUCTIONS TO BIDDERS

1. Drawings and Specifications, Other Contract Documents

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

2. Bids

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

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

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

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

3. Contract and Bond

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

4. Listing of Subcontractors

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

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

5. Interpretation of Drawings and Specifications

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

6. Addenda

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

7. Award of Contract

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

8. DFCM Contractor Performance Rating

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

9. Licensure

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

10. Permits

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

11. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

12. Time is of the Essence

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

13. Withdrawal of Bids

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

14. Product Approvals

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

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

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

16. Debarment

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

BID BOND

(Title 63, Chapter 56, U. C. A. 1953, 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: _____

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

NOTARY PUBLIC

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



Division of Facilities Construction and

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.

GROUND 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

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM
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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.

Table with 4 columns: TYPE OF WORK, SUBCONTRACTOR, 'SELF' OR 'SPECIAL EXCEPTION', SUBCONTRACTOR BID AMOUNT, CONT. LICENSE #. The table contains 15 empty rows for data entry.

We certify that:

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

FIRM: _____

DATE: _____

SIGNED BY: _____

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

CONTRACTOR'S AGREEMENT

FOR:

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

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

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

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

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

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

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

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

CONTRACTOR'S AGREEMENT
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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.

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: _____

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

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. 1953, 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, 1953, 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



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

**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
<u>Agency Comments:</u>	
<u>A & E Comments:</u>	
<u>DFCM Project Manager Comments:</u>	

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

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

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
<u>Agency Comments:</u>	
<u>A & E Comments:</u>	
<u>DFCM Project Manager Comments:</u>	

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

Signed by:	Date:	Mean Score
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Additional Comments:

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**ADMINISTRATIVE PROVISIONS
SECTION 01005**

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Contractor shall comply with these administrative provisions governing providing all materials, labor, transportation, bonds, insurance and other items required to accomplish the scope of Work associated with the project as identified on the Drawings and as specified herein.
- B. Administrative provisions include, but are not limited to the following:
 - 1. Title of Work, and type of Contract
 - 2. Work Sequence
 - 3. Contractor Use of Premises
 - 4. Owner Occupancy
 - 5. Owner-furnished Services
 - 6. Allowances
 - 7. Alternates
 - 8. Applications for Payment
 - 9. Coordination
 - 10. Field Engineering
 - 11. Reference Standards

1.2 TITLE OF WORK

- A. Work of this contract comprises general construction of seven post-tension concrete tennis courts, together with all appurtenances and related work, and restoration of existing improvements removed or damaged as a consequence of the construction.
- B. The work will be done at Weber State University, under State of Utah D.F.C.M. guidelines.

1.3 CONTRACT METHOD

- A. Construct the work in its entirety under a single lump sum contract.
- B. Items noted "NIC" (Not In Contract), will not be installed in this contract.

1.4 WORK SEQUENCE

- A. Provide and coordinate construction schedule and operations with the Owner and Engineer.

1.5 CONTRACTOR USE OF PREMISES

- A. Notify Weber State University, Campus Planning & Construction Department at least 48 hours prior to commencing any work on the property. Limit use of premises for Work and for construction operations; Limit construction operations to areas within the Construction Limits or Easement.
- B. Limit access to site from public roads or other construction easements as shown. Do not enter private property to gain access to work area.

- C. Coordinate use of premises under direction of Owner.

1.6 OWNER OCCUPANCY

- A. Owner will occupy premises during entire period of construction, for the conduct of his normal operations. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

1.7 OWNER-FURNISHED SERVICES

- A. Services furnished and paid for by Owner:
 - 1. Tap water is available at the adjacent Swenson Gymnasium building located within 200' of the tennis court construction. If said tap water is inadequate, or is unavailable for the contractor's needs, then the contractor shall arrange and pay for construction water through WSU Campus Planning and Construction Department.
 - 2. Construction Survey stakes and paid for by Owner. Contractor is required to protect and maintain survey staking. Failure due to negligence in maintaining survey staking and requiring re-staking will be paid for by the Contractor.
 - 3. Remove and salvage existing storage sheds. Reconstruct/assemble on new concrete pad constructed by contractor.
 - 4. Owner shall employ and pay for an Independent Testing Laboratory to perform inspections tests, and other services required by individual specification sections.
- B. Contractor's Responsibilities:
 - 1. Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, mix design, equipment, storage and assistance as requested.
 - a. Notify Engineer and Testing Laboratory 24 hours prior to expected time for operations requiring testing services.
 - b. Make arrangements with Testing Laboratory and pay for additional samples and test for Contractor's convenience.
 - 2. Preserve and maintain construction stakes.
 - 3. Portable Restroom Facilities

1.8 ALLOWANCES

- A. Not used.

1.9 ALTERNATES

- A. Alternates quoted in the Bid Form will be exercised as Owner option. Accepted alternates will be listed in Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work affected by accepted alternates as required to complete the Work.

1.10 APPLICATION FOR PAYMENT

- A. In accordance with the General Conditions, submit periodic applications for payment for review and approval.
- B. Submit three copies of each application for payment under procedures of Section 01300 and in accordance with the General Conditions, on Owner approved form.
- C. Content and Format: That specified for Schedule of Values in Section 01300.

1.11 COORDINATION

- A. Coordinate work of the various sections of specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodation items installed later.

1.12 FIELD ENGINEERING

- A. Verify locations of all existing underground utilities and facilities and other items affecting the work and coordinate work with the owner of those utilities and other facilities. Call Blue-Stakes Location Service at least 48 hours before digging.
- B. Provide field engineering services as required to establish grades, lines, and levels from construction stakes in order to complete the work in accordance with these drawings and specifications.
- C. The locations of existing underground utilities depicted on the drawings are shown in an approximate way only. Determine the exact location of all existing utilities, whether or not shown on the drawings, before commencing work. Contractor agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities. If damaged or removed, the existing utility shall be restored or replaced by Contractor in as nearly the original condition and location as is reasonably possible.
- D. Locate and protect survey reference lines, bench marks and monuments provided by the Owner for the control of the work.
- E. If survey control lines and monuments are destroyed or altered as a consequence of construction, replace as directed, at no cost to the Owner.

1.13 REFERENCE STANDARDS

- A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is specified.
- C. Obtain copies of standards when required by individual Specifications section. Maintain copy at jobsite during progress of the specific work.
- D. Schedule of references:

AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute Box 19150 Redford Station Detroit, MI 48219
AGC	Associated General Contractors of America 1957 E Street, N.W. Washington, DC 20006
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington DC 20036

ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive Conshohocken, PA 19428-2959
CLEMTI	Chain Link Fence Manufacturers Institute 1101 Connecticut Avenue, N.W. Washington, DC 20036
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Road Schaumburg, IL 60195
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

**MEASUREMENT AND PAYMENT
SECTION 01025**

DIVISION 1-GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Measurement and payment criteria applicable to portions of the Work performed under a unit price payment method.
- B. Defect assessment and non-payment for rejected work.

1.2 AUTHORITY

- A. The Engineer will take all measurements and compute quantities accordingly.
- B. Assist by providing necessary equipment, workers, and survey personnel as required.

1.3 UNIT QUANTITIES SPECIFIED

- A. Quantities and measurements indicated in the Contract Documents are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment.
- B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

1.4 MEASUREMENT OF QUANTITIES

- A. Measurement Devices:
 - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.
- B. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- D. Measurement by Area: Measured by square dimension using mean length and width or radius.
- E. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

- F. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.5 PAYMENT

- A. Payment Includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.
- B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit sum/price for Work which is incorporated in or made necessary by the Work.

1.6 DESCRIPTION OF BID ITEMS

- A. The Work at the Weber State Tennis Courts project generally consists of the following:

BASE BID

1. **Mobilization** - Measurement is a lump sum item. Payment includes all costs associated with mobilization, demobilization, establishment of all facilities necessary for the Work, bonds, dust control, temporary controls, install, maintain and remove any/all necessary BMP's required by jurisdictional authority, traffic control, install, maintain and remove project any/all limits of disturbance fence, fees, permits, clean-up, administrative services and all costs associated with the project that are not included in other bid items, but are incidental to the work.
2. **Demolition** - Measurement is a lump sum item. Payment includes all cost associated with full depth sawcutting, removal and disposal of the existing tennis court perimeter concrete, including the removal and disposal of all fence materials and net posts with appurtenant concrete anchors, removal of perimeter concrete sidewalks and concrete under the existing bleachers, including disassembling and removal of existing bleachers. Work includes but is not limited to: full depth sawcutting, removal and disposal of the existing tennis court perimeter concrete as depicted on the plans; removal and disposal of all fence materials and net posts complete with all appurtenant concrete anchors; cleaning. All work complete and in place in accordance with the project plans and specifications.
3. **Construct Post Tension Concrete Tennis Courts** - Measurement is a lump sum item. Payment includes all cost associated with the construction of the post-tension concrete tennis courts. Work includes but is not limited to: survey and layout from Owner furnished survey control; furnish, install, grade and compact untreated base course material; furnish and install polyethylene vapor barriers; install tension cables and chairs; furnish and install reinforcement steel and metal keyways; forming, placing, and finishing concrete to proper elevation and grade; testing (paid for by Owner); furnishing and installing vinyl coated chain link fence and gate materials, including new fence on existing retaining walls (see item 6 below "**Fence Demolition and Re-Construction**"); furnish and install ACO Trench Drain and discharge 4" outfall drain pipe to daylight 12' west of courts with sufficient riprap @ outfall to control slope erosion; furnish and install tennis court paint striping and markings; furnish and install net posts, nets and centerline net strap anchors. All work complete and in place in

accordance with the project plans and specifications, and American Sports Builder Association Standards.

4. **Construct 4" Thick Concrete Sidewalk(s) and New Floor for Existing Storage Sheds** - Measurement is a lump sum item. Payment includes all cost associated with properly installing and finishing concrete sidewalk and floor slab as depicted in plans. Owner to disassemble and remove storage sheds in advance of Contractor construction activities. Work includes but is not limited to: site preparation and removal of sod and topsoil as required for subgrade; disposal and/or salvage of sod for landscape restoration; stockpile topsoil for restoration work; preparation and compaction of subgrade soils; grading; installing and compacting untreated base course and/or structural fill as required to achieve proper grade; forming, placing, and finishing concrete to the proper elevation and grade; install all necessary expansion and contraction joints; and testing (paid for by Owner). All work complete and in place in accordance with the project plans and specifications.
5. **Landscape Restoration (Topsoil, Sod and Irrigation Sprinkler Repairs)** - Measurement is a lump sum item. Payment includes all cost associated with landscape, sod, irrigation sprinkler system repairs and appurtenant electrical repairs, required by tie-ins of new improvements and construction related activity. All construction related damage and subsequent repairs will be restored and paid for by the contractor. Work includes but is not limited to installing topsoil stockpiled by project demolition requirements; grading, raking and compacting; furnishing and installing new or salvaged sod; sprinkler repairs damaged by construction work; sprinkler head adjustments to match new grades; relocation of sprinkler heads as required by new sidewalk construction; sprinkler electrical repairs as required and coordination with the owner on watering and maintaining newly placed sod. All work complete and in place in accordance with the project plans and specifications.
6. **Fence Demolition and Re-Construction** - Measurement is a lump sum item. Payment includes all cost associated with; removal and disposal of all chain link fence fabric and costs; install new vinyl coated top and middle rails; furnish and install new vinyl coated bottom rails; furnish and install vinyl coated chain link fence fabric; furnish and install vinyl coated appurtenances to complete the tennis court fencing in accordance with the project plans; disposal of demolished materials. Work includes but is not limited to: the removal and disposal of all chain link fence fabric in preparation for re-construction of vinyl coated chain link fence; furnish and install new vinyl coated top and middle rails; furnish and install new vinyl coated bottom rail; furnish and install new vinyl coated chain link fence fabric; furnish and install vinyl coated appurtenances to complete the tennis court fencing. All work complete and in place in accordance with the project plans and specifications.
7. **Rock Retaining Wall** – Measurement is a lump sum item. Payment includes all cost associated with the preparation of existing soils and furnishing and installing large rock as depicted in the project plans and details to accommodate new grading to support and retain new improvements. Work includes but is not limited to civil engineering design and construction oversight by a Licensed Civil or Geotechnical Engineer in the State of Utah; excavation and removal of existing sod and sub-grade soils, and placement of structural fill or base course materials to prepare suitable foundation for installing retaining wall rock(s); furnish and install large rock and chink voids with smaller rock/stone at the rock

abutment/ interface(s) as required to fill large voids. All work complete and in place in accordance with the project plans and specifications.

ADDITIVE ALTERNATE #1

8. **Re-assemble and Install First Three Rows of Salvaged Bleachers –** Measurement is a lump sum item. Payment includes all cost associated with re-assembling the first three rows of salvaged bleachers and installing on the new concrete sidewalk/slab located on the west side of the new Tennis Courts as depicted in the plans. All work in accordance with the project plans and specifications

- B. It is the responsibility of the Contractor to fully inform himself regarding all Federal, State and local tax laws, rules or regulations furnished under this Contract, including all exemption provisions and procedures.
- C. All bid prices for material, equipment and labor for the Work under this Contract is inclusive of any tax for materials which are imposed by any governing agency to which the Work hereunder is subject. The Contractor is solely responsible for assuring that all applicable taxes are included in his bid.

1.7 MOBILIZATION

- A. If there is no separate bid item in the Bid Form for mobilization, include all mobilization costs with other items of work.
- B. If there is a separate bid item in the Bid Form, mobilization will be paid as follows:
 - 1. Payment will be made at the contract lump sum for "Mobilization Payments will be made in accordance with the following table:

<u>Percent of Original Contract Amount Earned</u>	<u>Percent of Amount Bid for Mobilization to be Paid</u>
5%	40
15%	20
40%	30
50%	10

PART 2 - PRODUCTS - Not used

PART 3 - EXECUTION - Not used

END OF SECTION

**PROJECT MEETINGS
SECTION 01200**

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor participation in preconstruction conferences.
- B. Contractor administration of progress meetings.

1.2 RELATED REQUIREMENTS

- A. Section 01005 - Administrative Provisions: Coordination of Work.
- B. Section 01300 - Submittals: Progress Schedules, shop drawings, product data, and samples.
- C. Section 01400 - Quality Control
- D. Section 01700 - Contract Closeout: Project record documents.

1.3 PRECONSTRUCTION CONFERENCES

- A. Owner will administer preconstruction conference assisted by the Engineer for execution of Owner-Contractor Agreement and exchange of preliminary submittals and for clarification of Owner and Contractor responsibilities and review of administrative procedures.

1.4 PROGRESS MEETINGS

- A. Owner will schedule and administer on-site Project meetings throughout progress of the Work at maximum weekly intervals, called meetings, and pre-installation conferences.
- B. Attendance: Job superintendent, major subcontractors and suppliers; Owner and Engineer as appropriate to agenda topics for each meeting.
- C. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

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**SUBMITTALS
SECTION 01300**

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Procedures
- B. Construction Progress Schedules
- C. Schedule of Values
- D. Shop Drawings
- E. Product Data
- F. Manufacturer's Instructions
- G. Manufacturer's Certificates
- H. Samples

1.2 RELATED REQUIREMENTS

- A. Section 01005 - Administrative Provisions
- B. Section 01400 - Quality Control
- C. Section 01600 - Material and Equipment
- D. Section 01700 - Contract Closeout

1.3 PROCEDURES

- A. Deliver submittals to Engineer at address listed on drawings.
- B. Transmit each item under Engineer-accepted form. Identify Project, Contractor, subcontractor, and major supplier; identify pertinent Drawing sheet and detail number, and Specification Section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and Engineer review stamps.
- C. Submit initial progress schedules and schedule of values in duplicate within 15 days after date established in Notice to Proceed. After review by Engineer, revise and resubmit as required. Submit revised schedules with each Application for Payment, reflecting changes since previous submittal.
- D. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.
- E. After Engineer review of submittal, revise and resubmit as required, identifying changes made since previous submittal.
- F. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.
- G. Required Contractor submittals for this project include, but are not limited to the following:
 - 1. Concrete Mix
 - 2. Base Course
 - 3. Fences and Gates
 - 4. Steel Tendons and Reinforcement Bars
 - 5. Tennis Court Accessories
 - 6. Tennis Court Surfacing Products and Color Scheme
 - 7. Paint

8. Topsoil
9. Sod
10. Monthly Construction Progress Schedule

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit horizontal bar chart with separate bar for each major trade or operation, identifying first work day of each week.
- B. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Show projected percentage of completion for each item of Work as of time of each Application for Progress Payment. Submit each month with Contractor's Application for Payment.
- C. Show submittal dates required for shop drawings, product data, and samples, and product delivery dates, including, if applicable, those furnished by Owner and those under Allowances.

1.5 SCHEDULE OF VALUES

- A. Submit typed schedule on 8-1/2" x 11" paper; Contractor's standard form or media-driven printout will be considered on request.
- B. Format: Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification Sections.
- C. Include in each line item amount of Allowances specified in Section 01005.
- D. Include in each line item a directly proportional amount of Contractor's overhead and profit.
- E. Provide a sub-schedule for each separate stage of Work specified in Section 01005.
- F. Revise schedule to list change orders, for each application for payment.

1.6 SHOP DRAWINGS

- A. Submit the number of copies which Contractor requires, plus two (2) copies which will be retained by Engineer.

1.7 PRODUCT DATA

- A. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to the Work.
- B. Submit the number of copies which Contractor requires, plus two (2) copies which will be retained by Engineer.

1.8 MANUFACTURER'S INSTRUCTIONS

- A. When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation start-up, adjusting, and finishing, in quantities specified for product data.

1.9 MANUFACTURER'S CERTIFICATES

- A. Provide certificates of compliance with specifications as requested by Architect / Engineer or individual Specifications sections.

1.10 SAMPLES

- A. Provide samples of materials as required by individual Specification sections.
- B. Include identification on each sample, giving full information.
- C. Submit the number specified in respective Specification section; one will be retained by Architect/Engineer.
- D. Provide field samples of finishes at Project as required by individual Specifications section.

END OF SECTION

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**QUALITY CONTROL
SECTION 01400**

DIVISION 1-GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Quality Control
- B. Workmanship
- C. Manufacturer's Instructions
- D. Manufacturer's Certificates
- E. Manufacturer's Field Services
- F. Testing Laboratory Services

1.2 RELATED REQUIREMENTS

- A. General Conditions: Inspection and testing required by governing authorities.
- B. Section 01005 - Administrative Provisions.
- C. Section 01300 - Submittals: Shop Drawings, Product Data, and Manufacturer's Instructions
- D. Section 02210 - Grading: Tests required for earthwork and subgrade preparation.
- E. Section 03300 - Cast-in-Place Concrete: Tests required for concrete.
- F. Section 02230 - Base Course: Tests required for base course compaction.
- G. Section 03700 - Post-Tension Concrete Tennis Courts: Test required for subgrade preparation, placement and compaction of base course, and concrete testing.

1.3 QUALITY CONTROL - GENERAL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.4 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and cracking.

1.5 MANUFACTURERS' INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Architect / Engineer before proceeding with the work.

1.6 MANUFACTURERS' CERTIFICATES

- A. When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

1.7 TESTING LABORATORY SERVICES

- A. Owner shall employ and pay for services of an Independent Testing Laboratory to perform inspections, tests, and other services required by individual Specification Sections.
- B. Services will be performed in accordance with requirements of local jurisdiction having authority and with specified standards.
- C. Reports will be submitted to Engineer in duplicate giving observations and results of tests, indicating compliance or non-compliance with specified standards and with Contract Documents.
- D. Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, mix design, equipment, storage and assistance as requested.
 - 1. Notify Engineer and Testing Laboratory 24 hours prior to expected time for operations requiring testing services.
 - 2. Make arrangements with Testing Laboratory and pay for additional samples and tests for Contractor's convenience.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
SECTION 01500**

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Temporary Utilities
- B. Sanitary Facilities
- C. Barriers and Enclosures
- D. Protection of Installed Work
- E. Dust, Water and Noise Control
- F. Construction Cleaning
- G. Project Identification
- H. Traffic Regulation
- I. Removal

1.2 RELATED REQUIREMENTS

- A. Section 01005 - Administrative Provisions.
- B. Section 01700 - Contract Closeout: Final cleaning.

1.3 TEMPORARY UTILITIES

- A. Electricity, Lighting:
 - 1. Provide service required for construction operations, with branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.
 - 2. Provide lighting as requires for construction operations.
- B. Heat, Ventilation:
 - 1. Provide as required to maintain specified conditions for construction operations, to protect materials and finishes from damage due to temperature or humidity.
- C. Telephone Service:
 - 1. Project foreman/superintendent shall have and maintain mobile phone service throughout the construction period.
- D. Water:
 - 1. Culinary water is available at the Swenson Gymnasium building located to the northwest of the existing tennis courts. If this water source is inadequate to meet the Contractors' needs, then Contractor shall arrange and pay for construction water through WSU Campus Planning and Construction Department.

1.4 SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.
- B. Existing facilities shall not be used.

1.5 BARRIERS AND ENCLOSURES

- A. Provide temporary fence or enclosure to prevent public entry to construction areas,

allow for Owner's use of site, protect existing facilities and adjacent properties from damage due to construction operations, and minimize restoration work.

- B. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

1.6 PROTECTION OF INSTALLED WORK

- A. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage. Repair or replace at Owner's option any installed work damaged by traffic, the public, or Work operations.
- B. Prohibit traffic on restored lawn and landscaped areas.

1.7 DUST, WATER AND NOISE CONTROL

- A. Surface Water, Erosion and Sediment Control:
 - 1. Surface water shall be controlled so that the construction area is 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.
 - 2. Maintain excavations free of water. Provide and operate pumping equipment.
 - 3. Prevent erosion and sedimentation.
 - 4. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
- B. Dust Control:
 - 1. 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 construction.
 - 2. 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.
 - 3. Provide and operate a mobile tank sprinkling unit as required during construction.
 - 4. 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.
 - 5. Execute work by methods to minimize raising dust from construction operations.
- C. Noise Control:
 - 1. Execute construction between the hours of 8:00 A.M. and 5:00 P.M. unless otherwise approved by Owner.

1.8 CONSTRUCTION CLEANING

- A. All public and private areas used as haul roads shall be continuously maintained and cleaned of all construction caused debris such as mud, sand, gravel, soils, pavement fragments, sod, etc. Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.
- B. Public roads shall be maintained in accordance with applicable ordinances and regulations.
- C. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and shall remove daily all refuse, dirt, damaged materials, unusable materials, and all other trash

- or debris that he has created from his construction activities.
- D. Materials and equipment shall be removed from the site as soon as they are no longer necessary; and upon completion of the work and before final inspection, the entire worksite shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be included in the Contractor's Bid.

1.9 TRAFFIC REGULATION

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.
- D. Provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroach on public traffic lanes. Provide control in accordance with local authority having jurisdiction.
- E. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- F. Consult with authorities, establish public thoroughfares to be used for haul routes and site access.
- G. Confine construction traffic to haul routes and designated construction limits.
- H. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- I. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- J. Relocate as Work progresses, to maintain effective traffic control.
- K. Maintain traffic flow to private driveways during entire contract period.
- L. Post-mounted traffic control and informational signs, traffic cones and drums, flagman equipment: As approved by local jurisdictions.
- M. Where local jurisdictions have no requirements, construct and erect according to "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD).
- N. Remove equipment and devices when no longer required. Repair damage caused by installation. Remove post settings to a depth of 3 feet.

1.11 FIELD OFFICE - Not Required

1.12 REMOVAL

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of 2 feet; grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

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**MATERIAL AND EQUIPMENT
SECTION 01600**

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Products
- B. Transportation and Handling
- C. Storage and Protection
- D. Product Options
- E. Products List
- F. Substitutions

1.2 RELATED REQUIREMENTS

- A. Section 01005 - Administrative Provisions.
- B. Section 01400 - Quality Control: Submittal of Manufacturers' Certificates
- C. Section 01700 - Contract Closeout: Operation and Maintenance Data

1.3 PRODUCTS

- A. Products include all material, equipment and system.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.
- D. Do not use products removed from an existing structure, pipeline, etc., except as specifically required, or allowed, by Contract Documents.

1.4 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition.
- B. Provide equipment and personnel to handle products by methods to prevent damage.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.5 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically name.
- C. Products Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications: No options, no substitutions allowed.
- D. Products Specified by Naming Only One Manufacturer: No options, no substitutions allowed.

1.7 PRODUCTS LIST

- A. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number (if applicable) of each product.

1.8 SUBSTITUTIONS

- A. Only within 15 days after date of Owner-Contractor Agreement will Engineer consider requests from Contractor for substitutions. Subsequently, substitutions will be considered only when a product becomes unavailable due to no fault of Contractor.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- C. Request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
 - 2. Will provide the same warranty for substitution as for specified product.
 - 3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects.
 - 4. Waives claims for additional costs which may subsequently become apparent.
- D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.
- E. Engineer will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a reasonable time.
- F. Only one request for substitution will be considered for each product. When substitution is not accepted, provide specified product.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

**CONTRACT CLOSEOUT
SECTION 01700**

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Closeout Procedures
- B. Final Cleaning
- C. Project Record Documents
- D. Operation and Maintenance Data
- E. Warranties and Bonds

1.2 RELATED REQUIREMENTS

- A. General Conditions: Fiscal provisions, legal submittals, and other administrative requirements.
- B. Section 01005 - Administrative Provisions.
- C. Section 01500 - Construction Facilities and Temporary Controls: Cleaning During Construction

1.3 CLOSEOUT PROCEDURES

- A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.
- B. Owner will occupy designated portions of the Project for the purpose of conduct of business, under provision stated in Certificate of Substantial Completion.
- C. When Contractor considers Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.
- D. In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- E. Engineer will issue final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order.

1.4 FINAL CLEANING

- A. Execute prior to final inspection.
- B. Clean and flush drainage systems.
- C. Clean site; sweep paved areas, rake clean other surfaces.
- D. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site.

1.5 PROJECT RECORD DOCUMENTS

- A. Store record documents separate from those used for construction.
- B. Keep documents current; do not permanently conceal any work until required

- information has been recorded.
- C. At Contract closeout, submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.
 - D. For each Specification Division, give names, addresses, and telephone numbers of subcontractors and suppliers.
List:
 - 1. Shop Drawings and Product Data
 - 2. Warranties

1.6 WARRANTIES AND BONDS

- A. Provide duplicate, notarized copies. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.
- B. Submit material prior to final application for payment. For equipment put into use with Owner's permission during construction, submit within ten (10) days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.
- C. Comply with General Conditions and ordinances of local jurisdictions having authority.
- D. Make periodic inspections during guarantee period and correct defective work or correct defective work as directed by the Owner or appropriate governing authority.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

**SITE PREPARATION
SECTION 02100**

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Preparation
- B. Portland Cement concrete removal
- C. Removal of fences and miscellaneous obstructions
- D. Disposal of waste materials

1.2 RELATED WORK

Not used.

1.3 QUALITY ASSURANCE

- A. All tree trimming and removal shall be done in accordance with recognized tree surgery standards.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

- A. No clearing, demolition, or removal of any kind shall proceed until all existing improvements 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. Within 10 feet of clearing limits, inspect, photograph with video tape, and record condition of concrete slabs, structures, landscaping and other features to remain which might be affected by work. Allow Owner to view tape and approve prior to proceeding with the work.
- D. Areas to receive planting, 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.
- E. Give reasonable notice to Owner to permit him to salvage improvements within the construction limits that may be destroyed because of the work.
- F. Notify interested utility companies to be present if disturbing ground in the vicinity of utilities.
- 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.
- I. Protect all improvements to remain or outside of construction.

3.2 PORTLAND CEMENT CONCRETE REMOVAL

- A. Concrete shall be removed to neatly sawed edges with saw cuts made to a minimum depth of 5 inches.
- B. Concrete sidewalk to be removed shall be neatly sawed in straight lines either parallel to the curb or at right angles to the alignment of the sidewalk. No section to be replaced shall be smaller than 30 inches in either length or width.
- C. Unless otherwise shown on the Drawings, if the sawcut would fall within 30 inches of a construction joint, expansion joint, or edge, the concrete shall be removed to the joint or edge, except that where the saw cut would fall within 12 inches of a score mark, the saw cut shall be made in and along the score mark.

3.3 FENCES AND MISCELLANEOUS OBSTRUCTIONS

- A. No demolition or removal of fences or miscellaneous obstructions shall proceed until clearance is obtained from the Owner.
- B. Thoroughly review the plans, and remove and dispose of fence materials in accordance with the information provided on the plans. The existing bleachers shall be parts all salvaged and prepared for re-use as indicated on the drawings.

3.4 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

**GRADING
SECTION 02210**

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Preparation
- B. Excavation and filling
- C. Disposal of excess excavated and waste materials
- D. Compaction
- E. Dust and surface water control
- F. Field quality control
- G. Protection

1.2 RELATED WORK

Not used.

1.3 QUALITY ASSURANCE

- A. Comply with federal, state, and local codes and regulations.
- B. All working conditions shall be in accordance with the "Utah Occupational Safety and Health Standard for Construction".
- C. Freezing weather:
 - 1. Unless scheduling requirements of these specifications dictate otherwise, construction of fills during freezing weather shall not be done without approval of the Owner.
 - 2. If placement of earth materials during freezing weather is permitted by the Owner, such permission does not relieve the Contractor of the responsibility to perform the work in accordance with these specifications and at no additional cost to the Owner.

1.4 SUBMITTALS

- A. Submit the following in accordance with Section 01300 - SUBMITTALS:
 - 1. 50 lb. sample of structural fill material to be used. Submit samples packed tightly in containers to prevent contamination.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Structural Fill:
 - 1. Shall not be lumpy or frozen.

2. Shall be free from large concentrations of alkali, salt, 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 Owner is objectionable or deleterious.
3. Shall be "clean" granular soils graded within the following limits.

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
4 inch	100
No. 200	5 min.-20 max.

LL of fines less than 35
PI of fines less than 15

4. A maximum particle size of 2 inches is required of structural fill places in confined areas.
 5. Moisture conditions at the time of placement shall be such the material used will be compactable to required specs.
 6. Shall be approved by the Engineer prior to being used on the site of the work.
- B. Stabilizing structural fill: Mixture of clean coarse gravels and cobbles.
- C. Non-structural fill:
1. Shall not be lumpy or frozen.
 2. Shall be free from large concentrations of alkali, salt, and petroleum products, all roots, sod, limbs, and other vegetative matter, rocks larger than 6 inches in diameter, slag, cinders, ashes and rubbish, or other material that in the opinion of the Owner is objectionable or deleterious.
 3. Shall be either cohesive or granular.

PART 3 EXECUTION

3.1 PREPARATION

- A. Within 10 feet of construction limits, inspect, photograph, and record condition of concrete slabs, structures, landscaping and other features to remain which might be affected by clearing. Mark with paint any existing cracks on concrete along which work will take place, in order to determine after the construction is completed whether such damage was caused by the operations of the Contractor or had occurred previously. Any concrete showing unmarked cracks upon completion of construction will be evidence of damage by the Contractor's forces, and shall be replaced or repaired to the satisfaction of the Owner of the damaged concrete, at the Contractor's own expense.
- B. Obtain necessary permits required for grading.
- C. Trees, shrubs and lawn, areas to receive planting, rock outcroppings, fences, 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.
- D. Establish the location and extent of all underground utilities. Notify necessary utility companies to be present if disturbing ground in the vicinity of utilities. Protect active utility systems adjacent to or uncovered by any excavation during site grading. Maintain, re-route or extend as required, existing ditches, pipelines or utility lines to remain which pass through the construction limits. Pay costs for this work, except those covered by the utility companies.

- E. Accurately locate and record abandoned and active utility lines re-routed or extended, on Project Record Documents. Call Blue-Stakes for utility location.
- F. Maintain benchmarks, monuments and other reference points.
- G. Appropriate traffic control devices shall be provided in accordance with federal, state or local regulations to regulate, warn, and guide traffic at the work site.
- H. All work shall be performed so as to insure the least possible interference with the public convenience.

3.2 EXCAVATION AND FILLING

- A. Excavate cut areas to proper elevation. When Structural Fill or other material is to be placed upon exposed surface, take care to prevent disturbing of soils. A smooth-lipped bucket, or other equipment which will produce a smooth, undisturbed surface, shall be used to excavate areas which require placement of Structural Fill or other material on undisturbed natural soil subgrade. Excavation equipment with "teeth" shall not be used as this equipment may disturb the subgrade soils.
- B. Placement of Structural Fill:
 - 1. Structural Fill shall be used to fill below an area which is to be structurally loaded, or which is to support slab-on-grade or pavement, and shall extend from the properly prepared subgrade to the appropriate subgrade elevation. Excavated material which meets the specification requirements, including compaction and moisture provisions, may be used as Structural Fill.
 - 2. Under areas to receive structural fill, topsoil shall be completely removed.
 - 3. Prior to placing the structural fill, the subgrade shall be proof-rolled by passing moderately-loaded rubber tire-mounted construction equipment uniformly over the surface continuously at least twice. If excessively soft, loose or disturbed soils are encountered, they shall be removed as directed by Owner, to a maximum depth of two feet, and replaced with STABILIZING STRUCTURAL FILL, compacted to 95% of the maximum laboratory dry density determined by ASTM D-1557 or AASHTO T-180.
 - 4. Prior to placing structural fill, the area to receive the fill shall be prepared as specified in Section 02100.
 - 5. Structural fill should be placed in lifts not exceeding 4 inches if using small compactor in loose thickness.
- C. Placement of Non-Structural Fill:
 - 1. Non-Structural Fill shall be used to fill all areas which do not require Structural Fill. Excavated material which meets the specified gradation, compaction and moisture requirements may be used as Non-Structural Fill.
 - 2. Prior to placing Non-Structural Fill, the area to receive the fill shall be cleared as specified above.
 - 3. Non-Structural fill should be placed in lifts not exceeding 4 inches if using small compactor in loose thickness.
- D. Grading Tolerances:
 - 1. Finish areas to within not more than 0.10' above or below required elevations.
- E. Uniformly grade areas within construction limits, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- F. Unauthorized excavation:

1. Unauthorized excavation consists of removal of materials beyond indicated elevations or dimensions without specific direction of the Owner.
 2. Correct unauthorized excavation as directed, at no cost to the Owner.
- G. All material deposited in piles or windrows by excavating and hauling equipment shall be spread and leveled before compaction.
- H. Fills adjacent to structures shall be placed around the structure in lifts of constant elevation until finish grade is achieved.

3.3 DISPOSAL OF EXCESS EXCAVATED AND WASTE MATERIALS

- A. Remove waste material, unacceptable excavated material, surface and sub-surface vegetation, trash and debris and dispose of it off Owner's property in accordance with all applicable laws and ordinances.
- B. Excess excavated material shall be disposed of at the site shown on the Drawings. When quantity shown has been exceeded, dispose of excess excavated material off Owner's property in accordance with all applicable laws and ordinances.

3.4 COMPACTION REQUIREMENTS

- A. Each layer of structural fill shall be compacted to at least 95% of the maximum dry density, as determined by the ASTM D-1557 (AASHTO T-180) method of compaction. Non-structural fill shall be compacted to at least 90% of the maximum dry density, as determined by the ASTM D-1557 (AASHTO T-180) method of compaction.
- B. Where layer of soil material to be compacted must be moisture conditioned before compaction, uniformly apply water to surface of layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operation.
- C. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

3.5 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 a mobile tank sprinkling unit as required during construction.
- 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.

3.6 FIELD QUALITY CONTROL

- A. Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.
- B. Testing of compacted fill materials and subgrades will be performed by testing agency employed by the Owner. If, during the progress of work, tests indicate that compacted materials do not meet specified requirements, remove defective work, replace and retest at no cost to Owner.
- C. In each compacted fill layer, testing service shall perform at least one field density test for every 2000 sq. ft. of fill area, but in no case less than 3 tests.

3.7 PROTECTION

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and retted areas to specified tolerances.
- C. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.
- D. Where settling is measurable or observable in excavated or filled areas during general project warranty period, remove surface (pavement, lawn or other finish), add structural fill material, compact to required specifications, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION

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**BASE COURSE
SECTION 02230**

PART 1 GENERAL

1.1 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.

1.2 RELATED WORK

- A. Section 02525 Curbs, Gutters, Drive Aprons and Walks
- B. Section 03700 Post-Tension Concrete Tennis Courts

1.3 REFERENCES

- A. American Society for Testing Materials (ASTM).
- B. American Association of Safety and Highway Transportation Officials (AASHTO)

PART 2 PRODUCTS

2.1 BASE COURSE MATERIAL

- A. Base Course for Concrete Sidewalks, Curb and Gutter, Drive Aprons, Stairs and Tennis Courts shall be:
 - 1. Unwashed, hard, durable, angular pit run gravel or crushed natural stone.
 - 2. Shall be free from shale, silt, clay, loam, friable or soluble materials
 - 3. Shall be free from noticeable concentrations of alkali, salt, 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.
 - 4. Shall be graded as follows:

1" Gradation

<u>Sieve Size</u>	<u>Percent Passing By Weight</u>
1"	100
1/2"	79-91
No. 4	49-61
No. 16	27-35
No. 200	7-11

Or

3/4" Gradation

<u>Sieve Size</u>	<u>Percent Passing By Weight</u>
3/4"	100
3/8"	78-92
No. 4	55-67
No. 16	28-38
No. 200	7-11

PART 3 EXECUTION

3.1 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 in the presence of the Engineer by passing loaded rubber-tired construction equipment uniformly over the surface at a constant rate. At least two (2) passes shall be made over all subgrade areas.
- 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 95% maximum Modified Proctor Density using approved subgrade stabilizing material.
- D. Ensure subgrade is to required lines and elevations.

3.2 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. Place base course material on the prepared and accepted subgrade. The material shall be back-dumped and spread in a uniform lift thickness.
- C. 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 may be placed in one layer, provided the ability of the equipment to achieve specified compaction to the full layer depth is demonstrated. In no case shall compacted lift thickness be greater than 8".
- D. 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.
- E. 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.

- F. 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 therefore will be permitted.
- G. 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.
- H. The top surface of compacted base course shall be finished by blading or rolled with equipment designed for that purpose.
- I. 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.

3.3 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 a mobile tank sprinkling unit as required during construction.
- 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.

3.4 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:

<u>Item</u>	<u>Type</u>	<u>Frequency</u>
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

**CURBS, GUTTERS, DRIVE APRONS AND WALKS
SECTION 02525**

PART 1 GENERAL

1.1 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.

1.2 RELATED WORK

- A. Section 03200 - Concrete Formwork
- B. Section 03300 - Cast in Place Concrete

1.3 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.

1.4 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)

1.5 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 manufacturer's data for all products proposed.

1.6 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.

1.7 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

2.1 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.
 - 2. Fibermesh homopolymer polypropylene fibrillated fibers shall conform to the requirements of ASTM D-1116.
- 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.

2.2 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. Backer rod shall be installed per joint sealant manufacturer's recommendations.
- D. Select joint materials of sufficient strength, hardness and durability to withstand stiletto heel traffic without damage or deterioration.

2.3 REINFORCEMENT

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

2.4 FORMWORK

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

2.5 EQUIPMENT

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

PART 3 EXECUTION

3.1 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.

3.2 PLACING STEEL REINFORCEMENT

- A. Steel reinforcement shall be placed in accordance with the requirements of Section 03200 of these specifications.

3.3 PLACING CONCRETE

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

3.4 SIDEWALK, DRIVEWAY, AND CURB AND GUTTER JOINTS

- A. Locate all joints according to the approved joint plan, making 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 ($\frac{1}{2}$ ") 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. See plans for locations.
 2. Expansion joints in curb and gutter shall be one half inch ($\frac{1}{2}$ ") 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. Expansion joints in pavements shall be one half inch ($\frac{1}{2}$ ") in thickness and shall be placed where pavement joins existing walks, pavements and fixed objects. See plans for locations.
 4. Joint sealant shall be installed over all expansion joints. Provide and install bond breaker per the manufacturer's recommendations.
- D. Contraction Joints
 1. Sidewalks
 - a. Contraction joints shall be installed at intervals equal to the width of sidewalk using steel plates not more than $\frac{1}{4}$ " in thickness. See plans for locations.
 - b. Remove steel plates once concrete has reached initial set.
 - c. Tooled joints shall be rounded to provide a neat, workmanlike appearance.
 - d. Joints may be provided by cutting into fresh concrete to a minimum depth of $\frac{1}{4}$ of the walk thickness. Cut joints shall be straight and perpendicular to the walk. Cut joints within 24 hours of placement.
 2. Pavements
 - a. Contraction joints shall be installed by sawcutting or tooling. See plans for locations.
 - b. Tooled joints shall be rounded to provide a neat, workmanlike appearance.
 - c. Joints may be provided by cutting into fresh concrete to a minimum depth of $\frac{1}{4}$ of the walk thickness. Cut joints shall be straight and perpendicular to the pavement.
 3. Curb and Gutter
 - a. Contraction joints shall be installed according to the approved joint plan using steel templates not more than $\frac{3}{16}$ " 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- $\frac{1}{2}$ ". 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.

3.5 HOT WEATHER CONCRETING

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

3.6 COLD WEATHER CONCRETING

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

3.7 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.
 - b. 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.

3.7 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.

3.8 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

**RESTORATION OF EXISTING IMPROVEMENTS
SECTION 02590**

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Contractor shall provide all materials, labor, equipment, transportation, and other items required to restore existing improvements dislocated, damaged, or removed as indicated or as required to accomplish Work of other sections of these specifications. All restoration Work shall be in accordance with applicable regulations and as specified herein.
- B. Restoration of existing improvements damaged by construction includes, but is not limited to the following:
 - 1. General Restoration Requirements
 - 2. Restoration or replacement of asphaltic concrete, or Portland Cement concrete pavements, including base course.
 - 3. Portland Cement concrete curbs, gutters, sidewalks, and driveways.
 - 4. Landscaping improvements including irrigation sprinkler systems.
 - 5. Miscellaneous improvements

1.2 RELATED WORK

- A. Section 02525 - Curbs, Gutters, Drive Aprons and Walks

1.3 QUALITY ASSURANCE

- A. All work shall be performed by experienced and qualified workmen.

1.4 REFERENCES

- A. The applicable provisions of the latest editions of the References listed below shall govern the Work covered under this Section, unless there is a conflict between said References and the requirements of this Section. In the case of such a conflict, the requirements of this Section shall apply.
- B. State of Utah Standard Specifications for Road and Bridge Construction, latest edition including all addendums.
- C. American Society for Testing and Materials (ASTM)
- D. American Association of State Highway and Transportation Officials (AASHTO)
- E. American Concrete Institute (ACI)
- F. Concrete Reinforcing Steel Institute (CRSI)

1.4 SUBMITTALS

- A. Submit shop drawings, manufacturer's literature, certifications, and other product data.
- B. Required submittals include, but are not limited to:

1. Manufacturer's recommended transportation, unloading, and storage requirements as well as installation guides and instructions for materials provided as part of this Work.
 2. Evidence of materials conformance with applicable requirements as well as these specifications.
 3. Dimensional information for pipes, valves, fittings, castings, structures and other items provided as part of this Work.
- C. Contractor shall maintain accurate construction record drawings for items restored as part of this Work, but covered by subsequent landscaping, paving or as a result of Work of other sections of these specifications. These records shall be submitted to Engineer for approval prior to application for final payment.

1.5 QUALITY ASSURANCE

- A. Transportation, handling, storage and installation practices shall be in accordance with manufacturer's recommended practice for materials provided as part of this Work.
- B. Use adequate numbers of skilled workmen who are trained and experienced in the type of construction required.
- C. The quality of the finished restored improvement, as determined by the Owner, shall be of equal or better quality than was said improvement prior to being damaged or removed.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Contractor shall be responsible for proper transportation, unloading, handling, storage, and security of all equipment and materials to be provided as part of this specification in accordance with manufacturer's recommendations.
- B. Materials shall be stored in such a manner as to prevent damage or degradation. Any materials damaged prior to installation shall be removed from the project and replaced with new materials at no additional cost. Lost or stolen materials shall be replaced at no additional cost.

1.7 MEASUREMENT AND PAYMENT

- A. No measurement will be made for this item. Payment is included as part of all other bid items associated with the project.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers providing materials or equipment as part of this specification shall have a minimum of five (5) years experience in the design, manufacture, testing and support of such materials.
- B. Manufacturers shall provide, upon request, verification of a consistent record of meeting or exceeding materials or performance standards as specified herein.

2.2 MATERIALS - GENERAL

- A. Materials shall be as required to complete the restoration of existing improvements, and shall be at least equal to original improvement at the time of damage or removal, as

determined by the owner of said improvement, and shall match original construction in finish and dimension.

- B. Materials shall be in accordance with requirements of local jurisdiction having authority. Obtain approval of all materials from local jurisdiction having authority prior to ordering.

2.3 UNTREATED BASE COURSE

- A. Untreated Base Course shall be in accordance with Specification Section 02230 - 1-inch or ¾" Gradation:

2.4 BITUMINOUS SURFACE COURSE

- A. Asphaltic concrete surface course shall be plant mix in accordance with State of Utah Standard Specifications for Road and Bridge Construction, Section 402, 1/2-inch Gradation:

<u>Sieve</u>	<u>% Passing</u>
1/2"	100
No. 4	60 - 80
No. 16	28 - 42
No. 50	11 - 23
No. 200	5 - 9

2.5 PORTLAND CEMENT CONCRETE

- A. Portland cement concrete for curbs, gutters, sidewalks and driveways shall be in accordance with Specification Section 03300.

2.6 SOD AND VEGETATION

- A. All materials shall be from sources approved by the Owner; however, such approval does not relieve the Contractor from responsibilities for growth, maintenance and replacement has specified herein.
- B. Topsoil:
 - 1. Use suitable on-site stockpiled topsoil salvaged during demolition and site preparation operations, or imported from approved sources.
 - 2. Topsoil for backfill mixture for tree pits shall be fertile, friable, natural loam, surface soil, reasonably free of clay lumps, brush, weeds, and other litter, and free of rocks, stumps, stones larger than 2" in any dimension, and other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from naturally well-drained sites where topsoil occurs in a depth of not less than 4".
 - 3. Do not obtain from bogs or marshes.
- C. Sod:
 - 1. Strongly rooted blend of Kentucky Blue Grass sod, not less than 2 years old and free of weeds and undesirable native grasses.
 - 2. Provide only sod capable of growth and development when planted (viable, not dormant).
 - 3. Recommended Kentucky Blue Grass mixture is: 50% Baron, 25% Glade and 25% Touchdown, or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that Work covered under other sections of these specifications is complete to the point that Work covered under this section may properly commence without hindering or damaging Work of other trades. Do not proceed with construction until unsatisfactory conditions have been corrected.
- B. Verify that Work performed under other sections of these specifications has been adequately inspected, tested and accepted prior to covering up that Work as part of the Work specified under this section.
- C. Carefully examine restoration areas, verifying dimensions, materials and other restoration requirements with Engineer and Owner prior to beginning Work covered under this section.

3.2 METHODS AND PROCEDURES

- A. General Requirements
 - 1. Contractor shall obtain all permits necessary for the restoration of existing surface improvements.
 - 2. Contractor shall protect all public and private property adjacent to the work. Exercise due caution to avoid damage to such property.
 - 3. All improvements damaged or removed shall be restored in accordance with local jurisdiction having authority. In case of conflict between these Specifications and local authority specifications, the local authority shall govern.
 - 4. Repair or replace all existing surface improvements, which were damaged or removed as a result of operations of Work under this contract. Restoration shall be at least equal quality and identical in dimension to original improvement unless specifically specified otherwise.

3.3 INSTALLATION

- A. Concrete Curbs, Gutter, Sidewalks and Driveways
 - 1. Shall be removed and replaced to the next joint or scoring lining beyond the actually damaged or broken sections; or in the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be removed by saw cutting full-depth.
 - 2. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements. Where necessary, lampblack or other pigments shall be added to the new concrete to obtain the desired results.
 - 3. Concrete forms shall be true to line and of sufficient strength to ensure against bulging or displacement.
 - 4. Contraction and expansion joints shall match original construction in placement and size, unless otherwise required by local jurisdiction having authority.
 - 5. Reinforcement shall be replaced as in original construction, unless otherwise required by local jurisdiction having authority, and shall be installed in accordance with applicable CRSI and ACI Standards.
 - 6. Finishing and curing shall be in accordance with local jurisdiction having authority.
- B. Vegetated Areas
 - 1. Prior to placing sod or other final vegetative cover, examine and repair the subgrade as necessary to assure a smooth and even surface which will match grade and contours of surrounding undisturbed ground. Finish grade construction areas to match grade prior to construction activities. Assure that a positive slope

away from all building walls is maintained for at least 10 feet to prevent runoff from approaching walls.

2. Prepare soil under areas to receive vegetation by placing topsoil to a depth equal to surrounding conditions or to 6", whichever is greater.
 3. Roll and rake areas receiving vegetation to smooth, even surface, free of ridges, with loose, uniformly fine texture.
 4. Allow for final vegetation thickness when preparing subgrade.
 5. Restore raked areas to specified condition if eroded or otherwise disturbed after fine grading and prior to placing vegetative cover.
 6. Remove stones over 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter.
 7. Limit preparation to areas which will be planted promptly after preparation.
 8. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before installing sod. Do not create a muddy soil condition.
- C. Irrigation Sprinkling Systems:
1. Restore all sprinkling systems disturbed, removed, or damaged by construction operations in a condition at least equal to that prior to construction, as per Standard Salt Lake County Specifications.
- D. Sod Installation:
1. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass.
 2. Immediately after planting, sod shall be thoroughly watered with a fine spray. Watering shall occur as frequently as needed to keep sod constantly moist for a period of 14 days after planting.
- E. Miscellaneous Restoration Items
1. All other improvements interrupted or removed to permit the construction specified herein shall be restored. Miscellaneous improvements to be restored shall include, but shall not be limited to, the following:
 - a. Drains
 - b. Fences
 - c. Pavements
 - d. Utilities
 - e. Irrigation Sprinklers
 - f. Tennis Court Retaining Walls

3.4 PROTECTION

- A. Provide barricades and restrict access as appropriate to prevent damage to Work in place.
- B. Contractor shall be responsible for protection of Work in place against displacement, damage, loss or theft until Owner's acceptance. Any Work installed and subsequently damaged, lost or displaced shall be repaired or replaced to the Owner's satisfaction at no additional cost.

3.5 CLEANING

- A. Thoroughly clean, rake, wash and/or flush all restoration Work prior to submitting for Owner's acceptance.

3.6 TESTING - Not used.

END OF SECTION

**CONCRETE FORM WORK
SECTION 03100**

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Concrete formwork for on-site cast-in-place concrete curb, gutter, pavements, drive aprons, post-tension concrete tennis courts or other improvements removed or damaged during the work.

1.2 RELATED WORK

- A. Section 02525 - Curbs, Gutters, Drive Aprons and Walks
- B. Section 03200 - Concrete Reinforcement
- C. Section 03300 - Cast-In-Place Concrete
- D. Section 03700 - Post-Tension Concrete Tennis Courts

1.3 QUALITY ASSURANCE

- A. Comply with federal, state, and/or local codes and regulations.
- B. All work shall be performed by experienced and qualified workmen.

PART 2 PRODUCTS

2.1 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

3.1 PREPARATION

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

3.2 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

CONCRETE REINFORCEMENT SECTION 03200

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Placing of concrete reinforcing for mow strip and tennis court perimeter beam.

1.2 RELATED WORK

- A. Section 03100 - Concrete Formwork
- B. Section 03300 - Cast-In-Place Concrete
- C. Section 03700 - Post-Tension Concrete Tennis Courts

1.3 QUALITY ASSURANCE

- A. Comply with federal, state, and/or local codes and regulations.
- B. All work shall be performed by experienced and qualified workmen.

1.4 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"

PART 2 PRODUCTS

2.1 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. Slip Dowels:
 - 1. Deformed and round Grade 60 steel bars conforming to the requirements of ASTM A- 615, both ends fitted with "Speed Dowel" to create a bond break.
 - 2. "Speed Dowel" available thru White Cap Construction Supply – all plastic sleeves for assuring proper field positioning and alignment of steel slip dowels at concrete filler strip/perimeter beam interface.
- C. 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.

- D. 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

3.1 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.

3.2 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

**CAST-IN-PLACE CONCRETE
SECTION 03300**

PART 1 GENERAL

1.1 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

1.2 RELATED WORK

- A. Section 03100 – Concrete Formwork
- B. Section 03200 – Concrete Reinforcement
- C. Section 03700 – Post-Tension Concrete Tennis Courts

1.3 QUALITY ASSURANCE

- A. Qualification 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.

1.4 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 of Testing and Materials (ASTM):
 - 1. C-150, "Portland Cement"
 - 2. C-33, "Concrete Aggregates"
 - 3. C-94, "Ready-Mixed Concrete"

1.5 SUBMITTALS

- A. A mix 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.
- C. 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. The Owner will pay the costs of the first test only. Should the first test fail, the Contractor will pay for all subsequent testing.
- D. Submit manufacturer's information (Catalog data) for all products.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Ready-mixed: 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 material 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.

1.7 MEASUREMENT AND PAYMENT

- A. Payment for Cast-In-Place concrete will be included in the Lump Sum Bid Price(s) for the item requiring Cast-In-Place concrete. Such price shall include full Cast-In-Place concrete, and for all labor, equipment, tools and incidentals needed to complete the work in conformity with the plans and specifications.
- B. If any individual compressive strength test is below the specified required strength, the concrete may be accepted at a reduced price, Owner option. If Owner elects to accept at a reduced price, the price reduction shall apply to the amount of concrete represented by the strength test in accordance with the following schedule:

<u>PSI BELOW SPECIFIED STRENGTH SPECIFICATION</u>	<u>PAY FACTOR</u>
001 – 100	98
101 – 200	94
201 – 300	88
301 – 400	80

Concrete with compression strength of more than 400 psi below the required specified strength shall be evaluated by the Engineer for capabilities necessary to the integrity of

the structure. The Engineer may accept this concrete at a pay factor of 0.80, or require that it be replaced with acceptable material. The Engineer shall make the final decision.

1.8 WARRANTY

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

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement:
 1. Portland cement shall be Type II, low alkali, complying with ASTM C-150, unless otherwise specified.
 2. No air-entraining type of cement will be allowed.

- 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:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING (BY WEIGHT)</u>
3/8"	100
No. 4	95 – 100
No. 16	45 – 80
No. 50	10 – 30
No. 100	02 – 100

- 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. Fibermesh homopolymer polypropylene fibrillated fibers shall conform to the requirements of ASTM D-1116.
 3. 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. **SIDEWALKS, STAIRS, and CURBS ONLY!**

2.2 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-mix 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 will be required if tests indicate necessity for such increased quality to achieve the design strength.
- E. A minimum of 7 minutes mixing time is required after adding Fibermesh Polypropylene fibers.

Intended Use	Coarse Aggregate Size (inches)	Min. Cement Content Sack / CY	Min. 28-Day Compressive Strength (psi)	Min. 14-Day Flexural Strength (psi)	Slump (inches)	Air Entrainment (percent)	Max. Water / Cement Ratio
Curbs, Walks, & Stairs	3/4	6.5	4000	550	2.5 - 4.0	5 - 6.5	0.45

2.3 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 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

3.1 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.

3.2 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 expense 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.

3.3 PLACING CONCRETE

- A. Except by specific written authorization, concrete 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 more 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 in 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 a retempered concrete that has been contaminated by foreign materials.
- H. Struts, stays, and braces serving temporarily hold the forms in correct shape and alignment, pending the placing of concrete at their location, shall be removed for 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.

3.4 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. 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 will 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.

3.5 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 temperature 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, insulation, 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° F and 90° F 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.

3.6 EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS

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

3.7 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 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. Troweling 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 tie-holes 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.

3.8 FINAL FINISHING

- A. When the concrete has hardened sufficiently, the surface shall be given a broom finish. The broom shall be of an approved type.
- B. 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.
- C. The surface, as thus finished, shall be free from porous spots, irregularities, depressions, and small pockets or tough spots such as may be caused by accidental disturbing during the final brooming of particles of coarse aggregate embedded near the surface.

3.9 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 Specification Sections.
- D. Membrane curing compound method for curbs, walks, drive approaches and pavements.
 1. **Do not apply to post-tension concrete Tennis Courts.**
 2. 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.

3. 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.
4. Curing compound that had 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.
5. 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.
6. 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.
- B. All testing will be paid for by Owner, except retesting of material which fails to meet these specifications. Owner 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	Flexual 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 each class of concrete poured during one day.
3. Flexual 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 each class of 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 specifications.
6. Slump and air tests shall be made in accordance with ASRM 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 had 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 re-sampling 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, walks 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

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**REINFORCED POST-TENSIONED CONCRETE TENNIS COURTS
SECTION 03700**

PART 1 GENERAL REQUIREMENT

1.1 Scope

- A. The contract work to be performed under this specification consists of furnishing all of the required labor, materials, equipment, implements, parts and supplies necessary for, or appurtenant to, the construction of Hunter and Copperton Parks Tennis Courts Project in accordance with the specifications and drawings.

1.2 Standards

- A. The work shall be done in a thorough, workman-like manner by contractors of the American Sports Builders Association (ASBA), and shall conform to their standards for tennis court construction. Contractor shall have an ASBA Certified Tennis Court Builder on staff, and shall provide proof of that certification. Bidders who do not meet this requirement shall prequalify by submitting proof that they have successfully constructed not less than 3 post-tension concrete projects within the past three years, similar to the courts described in these bid documents. Additionally, contractor or subcontractor shall submit proof that they have successfully constructed not less than 3 tennis court surfacing projects in the last 5 years. Include with the prequalifications packet, representative photos and references for verification.
- B. All laying of cable, concrete work and stressing of cables shall be done by the selected contractor (no part of this work shall be subcontracted). This provision intent is to provide continuity and one source responsibility for the integrity of the post-tensioned slabs.
- C. The Contractor shall submit references from five similar, successfully executed projects.

1.3 Guarantee

- A. The Contractor shall guarantee the work against defective materials or faulty workmanship for a period of two (2) years, and that the colored surface will not wear through for a period of two (2) years from date of completion.

PART 2 PRODUCTS

2.1 Fine Grade Material

- A. Fine grade base material shall be an approved 3/4" minus road base capable of being rolled and compacted to form a consistent, uniform plane.

2.2 Portland Cement Concrete

- A. Concrete -
 - 1. 6 ½ bag mix Type II cement
 - 2. Course and Fine Aggregates per Specification Section 03300
 - 3. Compressive Strength - 4,000 PSI at twenty-eight (28) days
 - 4. Ready-mixed concrete shall be mixed with fiber mesh and delivered according to ASTM C-94 specifications for ready-mixed concrete with fiber mesh
 - 5. (4") maximum slump.
 - 6. Air entraining agent for 6.0% ± 1.0%

7. Water/cement ratio 0.52/1
8. Medium Sweat or Light Broom Finish
9. Tooled edges

2.3 Tensioning Cables and Anchors

- A. Post-tensioning strands and anchorages shall conform to the "PTI Guide Specifications for Post-tensioning Materials".
- B. The tensioning strands shall consist of one-half inch (1/2") diameter, 7-wire, stress relieved strands, having a guaranteed ultimate tensile strength of 270,000 PSI (270 Kips). Strands shall conform to ASTM-416. Cables shall be fabricated to proper length for each slab, coated with a permanent rust preventative lubricant and encased in slippage sheathing. Any damage to the sheathing shall be repaired with plastic tape prior to concrete placement. A maximum of six inches (6") exposed strands is permitted at the dead-end anchor. Install #4 rebar top and bottom @ dead heads.

2.4 Steel Reinforcement

- A. Grade 60 steel deformed billet bars

2.5 Steel Slip Dowels

- A. Deformed and round Grade 60 steel bars conforming to the requirements of ASTM A- 615. Use with "Speed Dowel" available thru White Cap Construction Supply – all plastic sleeves for assuring proper field positioning and alignment of steel slip dowels at concrete filler strip/perimeter beam interface. "Speed Dowels" shall be placed on both ends of the deformed #4 steel bar to create a bond break/slip dowel condition.

2.6 Tennis Court Chain Link Fencing

- A. Height of fence shall be 10'-0" for all new fence installations @ tennis court grade, and 4'-0" on top of existing retaining wall and west side spectator area as depicted on the plans.
- B. Fabric - Nine gauge core, eight gauge finish, 1- 3/4" diamond mesh black resin clad fabric shall have a fused and bonded polyvinyl chloride coating, minimum wall thickness of .015 inches over a galvanized substrate. The base metal shall have a minimum breaking strength of five hundred fifty pounds (550 lbs.) and a zinc coat weight of .1503 pounds per square foot of un-coated wire surface. Top and bottom selvage of the fabric shall be knuckled.
- C. Pipe and Accessories
 1. Method of Manufacturing - Pipe used for fence framework shall be cold rolled and electric-resistance- welded from steel conforming to ASTM A-569 and hot dip galvanized to ASTM A-525 G-90 zinc weight both inside and outside the pipe. All pipe materials shall be supplied with thermally fused and bonded black polyvinyl (PVC) meeting the requirements of ASTM F-668 (heavy Mil Vinyl LG 40 or equal)
 2. Posts - All line, terminal and gate posts shall be two and seven eighths inch outside diameter (2 7/8" O.D.) with a wall thickness of eleven gauge (11 Ga.) and minimum yield strength of fifty five thousand pounds per square inch (55,000 PSI).
 3. Top, Middle and Bottom Rail – Top, middle and bottom rails shall be one and five eighths inch outside diameter (1 5/8" O.D.) pipe with a wall thickness of thirteen gauge (13 Ga.) and a minimum yield strength of fifty five thousand pounds per square inch (55,000 PSI) and provided with seven inch (7") long expansion sleeve couplings. Middle rail is not required on 4' high fence.

4. Accessories
 - a. Fabric ties – Nine gauge core, eight gauge finish black resin clad (fused and bonded) Poly-vinyl chloride coating
 - b. Tension Wire – Not used
 - c. Tension Bands - Beveled edge type with nuts and bolts.
 - d. Brace Bands - Beveled edge type with nuts and bolts.
 - e. Line Post Tops - Heavy galvanized cast from eye top fitting.
 - f. Terminal Post Tops - Heavy galvanized iron tops of rounded type Construction.
 - g. Rail End Combo - Pressed Steel
 - h. Line Rail Clamps – Pressed Steel
 - i. Tension Bars – Heavy Duty Steel
 - j. Coating - All pipe and accessories shall be supplied with thermally fused and bonded black polyvinyl chloride (PVC) meeting the requirements of ASTM F 668.

- D. Gates - Construct gate frames with one and five-eighth inches outside diameter (1 5/8" O.D.) rail material with welded corners. Provide fabric filler same as used in fence and use heavy duty galvanized hardware with thermally fused and bonded black polyvinyl chloride (PVC) meeting the requirements of ASTM F 668.

2.7 Tennis Court Equipment

- A. Tennis Net Posts - Edwards Wimbledon Square Net Posts. Posts have internal brass worm gear take-up, baked on black polyester powder coating, continuous lacing rod, and galvanized sleeves. Posts are four inch (4") square with minimum three-sixteenths inch (3/16") wall thickness. Include base mounting sleeves.
- B. Nets - Edward's 40 LS Tennis net. Net has three (3) mm braided polyethylene, 1 3/4" square single mesh, two layers of 23 oz. vinyl coated polyester sewn with five rows of heavy lock stitched thread. Cable is 47' long and coated to 1/4" and 3700 lb strength. Net has side pockets with hickory wood dowels.
- C. Center Straps - Edward's Center Strap. Center strap is two inches (2") wide, white polypropylene webbing with adjusting buckle and bottom double-ended snap hook.
- D. Anchor - Anchor is tubular pipe eight inches (8") long by one and seven-eighths inches (1 7/8") diameter with a five-sixteenth inch (5/16") anchoring pin.

PART 3 EXECUTION

3.1 Site Preparation

- A. Subgrade
 1. The area will be graded to the required depth to accommodate the base and concrete thickness and provide a uniform one percent (1%) slope at plus or minus one tenth of a foot (+.1") in one plane. All fills will be placed in maximum six inch (6") layers and will be smooth and well compacted and to form a uniform plane. The contractor will alert the owner of any "soft spots" or structures that could affect the stability of the slab.
 2. The site preparation will be done so as to provide positive drainage away from the play courts.

- B. Fine Grade
 - 1. The base material shall be placed with automatic laser-regulated equipment capable of providing a true plane to plus or minus one-quarter inch (+1/4"). The depth of the fine grade base material shall be sufficient to develop one-quarter inch (1/4") accuracy.

3.2 Court Paving

- A. Forming - Forms shall be accurately set to the lines and to plus or minus one-quarter inch (+1/4") of finished grades indicated on drawings and be securely staked to prevent settlement of movement during placement of concrete. Forms shall remain until concrete has taken final set.
- B. Tensioning Cables and Anchors
 - 1. All cables shall be supported on chairs and loosely tied two inches (2") high at all intersections (too tightly tied, tendon friction will increase when tensioning) to prevent vertical and horizontal movement during concrete placement. Strands shall be placed as engineered. See drawing details for cable spacing.
 - 2. The perimeter beam cross section is 12" x 12". The cables are anchored approximately 4" down from the surface of the slab. Two #4 rebar continuous lies longitudinally around the court beam directly inside the cable anchor on top of the cables. Overlapping should be a minimum of 30 diameters.
 - 3. After the forms are removed and the concrete has set to a minimum of 1,700 PSI, the "half stress" tensioning procedure may begin. Approximately one (1) week later, each tendon may be tensioned to a maximum of eighty percent (80%) ultimate breaking strength, and anchored a minimum of seventy percent (70%) ultimate breaking strength.

100% Ultimate Breaking Strength	41,300
80% Ultimate Breaking Strength	33,000
70% Ultimate Breaking Strength	28,900
 - 4. The cable ends shall be cut off and cone holes grouted flush with edge of slab. Grout shall be non-shrink grout.
- C. Joints – There shall be a keyed construction joint between each court and at net line, plus or minus six inches (±6"), except when concrete filler strip divides courts. See plans for location and construction detail.
- D. Placing - A full court shall be placed in one (1) continuous operation without intervening joints of any kind. The five inch (5") thick slab will be placed with a sixty foot (60') mechanical screed capable of providing a surface to + 1/4" in 10' at a 1% slope.

Note: Finish surface shall not have a water-holding area greater than 1/8" deep (cover a nickel). This is to be determined by flooding the court with water, allowing it to drain for one hour on a 70-degree or warmer day.
- E. Curing - Immediately after finishing, the concrete shall be kept moist by covering with polyethylene, by sprinkling, by ponding or by curing compound (must be compatible with acrylic tennis surfacing material).

3.3 Tennis Court Chain Link Fencing

- A. Workmanship - The complete fence shall be plumb, both in line and transverse to the fence, straight and rigid with fabric tightly stretched and held firmly in place. Details of

construction not specified shall be performed in keeping with standard good fencing practices. Bottom of chain link shall hang one-half inch (1/2") from tennis surface.

- B. Posts - Space all posts not more than eight feet (8') apart and set in concrete bases at least thirty inches (30") deep and not less than (10") in diameter. Spacing on top of existing retaining wall shall match existing spacing (assume 10' o.c.)
- C. Top, Middle and Bottom Rails - Set top, middle and bottom rails as nearly parallel to the finish grade as possible and at the specified height of the fence.
- D. Fabric Ties - Provide a minimum of six (6) ties for each ten feet (10') of rail and one (1) tie to each foot of post height. Ties to tension wire shall be made with heavy galvanized hog rings at six (6) per ten feet (10') of tension wire.
- E. Tension Bands - Provide one (1) fastener for each one foot (1") of fabric height. (Minimum of 8 bands for 10 ft., 3 bands for 43").
- F. Gates - Gates shall swing easily and hang true and close into the plane of the fence. Gates shall be capable of swinging in both directions.

3.4 Tennis Court Equipment

- A. Net Posts - Set in concrete foundations three feet (3') deep by eighteen inches (18") diameter. Net posts to be laid out according to the American Sports Court Association specifications.
- B. Nets - Hung flush with the net posts and thirty –six inches (36") high in the center.
- C. Center Straps - Loop strap around net, hook into anchor, and tighten so that the net is thirty-six inches (36") high in the center.
- D. Center Strap Anchor - Set in concrete eight inches by twelve inches (8" x 12").

3.5 Tennis Court Concrete Surfacing – (Two Color System)

- A. Owner Approved Colors:
 - 1. Tennis Courts Plexipave Pro Purple
 - 2. Outside Courts Plexipave Dark Green
- B. Surface Preparation - Concrete shall have a medium sweat or light broom finish. DO NOT ALLOW ANY CURING AGENTS OR HARDENERS TO BE USED. Concrete must cure for thirty (30) days prior to surface application. Thoroughly remove all dirt, dust, mud, oil and all foreign matter.
- C. Concrete Preparer - Un-coated concrete surface must be etched with Concrete Preparer solution according to specification 10.13. After drying, all latent material must be removed from the surface.
- D. Primer Coat - Mix and apply California Ti-coat epoxy primer according to specification 10.17. Use only on un-coated surfaces.
- E. Acrylic Underlayment - One application of California Acrylic Resurfacer (black) shall be applied to the surface within 1- 3 hours after the application of Ti-Coat and while still tacky to fingertip touch. Dilution with water and sand is required utilizing the following mix:

Acrylic Resurfacer.....55 gal.
 Water.....20-40 gal.
 Sand.....(60 – 80 mesh) 600-900 lbs.
 Liquid Yield.....112-138 gal.
 Application Rate.....0 .07 - 0.08 gal./square yard

- F. Depressions - After the Acrylic Resurfacer has dried, the court shall be flooded to locate depressions covering a nickel. Depressions shall be filled with Court Patch Binder according to specification 10.14 using the following mix:

60-80 mesh silica sand (dry) 100 lbs.
 Plexipave Court Patch Binder.....3 Gallons
 Portland Cement, Type 1 (20 lbs. Min.) 1 - 2 Gallons

- G. Tack Coat - A tack coat is necessary under patches only and shall be mixed as follows:

 Plexipave Court Patch Binder diluted with one (1) part Court Patch Binder to two (2) parts water and allowed to thoroughly dry prior to patching. After patching, the surface shall not vary more than one-eighth inch (1/8") in ten feet (10') measured in any direction.

3.6 Fortified Plexipave Job Mix Sand Design

- A. Coordinate Sand Mix and Court Speed with Owner
- B. Application - Fortified Plexipave Acrylic textured coats shall be applied by rubber bladed squeegee on a clean, dry underlying surface in two (2) applications to obtain a total quantity of not less than .07-.05 gallons per square yard of area, depending on the surface and number of coats applied. Dilution with Plexichrome and water to obtain proper application consistency will be as follows:

Plexipave Color Base.....30 gallons
 Plexichrome20 gallons
 Water.....20 gallons

- C. The finished surface shall have a uniform appearance and be free from ridges and tool marks.

3.7 Tennis Court Playing Lines (Hand Painted)

- A. Two inch (2") wide textured playing lines shall be accurately located, marked and painted with Plexicolor Line Paint as specified by the American Sports Court Association.

END OF SECTION

METAL STAIRS
SECTION 055100

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Provide all equipment, materials, labor, tools and transportation and other items required to provide and install prefabricated metal stairs and railings.

1.2 RELATED WORK

- A. Section 033000 - Cast-in-Place Concrete

1.3 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer:
 - a. American Institute of Steel Construction (AISC) Certified firm having 10 years experience manufacturing components similar to or exceeding requirements specified in scope of project.
 - b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
 - 2. Installer: Acceptable to manufacturer.
- B. Comply with federal, state, and local codes and regulations
- C. Comply with hot or cold weather requirements as applicable.
- D. Stairs shall be warranted against defects in materials or workmanship for a period of two (2) years, subject to applicable laws and regulations.

1.4 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM A36 Standard Specification for Carbon Structural Steel.
 - 2. ASTM A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 3. ASTM A500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 4. ASTM A513 Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
 - 5. ASTM A786 Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
 - 6. ASTM A1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

7. ASTM A1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- B. American Welding Society (AWS):
 1. AWS D1.1 Structural Welding Code - Steel.
 2. AWS D1.3 Structural Welding Code - Sheet Steel.
 - C. American National Standards Institute (ANSI):
 1. ANSI A117.1 Accessible and Usable Buildings and Facilities Standards.
 - D. New York City Building Code Reference Standard:
 1. RS 6-1 Photoluminescent Exit Path Markings.
 2. RS 6-1A Additional Standards as Required by Reference Standard RS 6-1 for Photoluminescent Exit Path Markings.
 - E. The Society for Protective Coatings (SSPC):
 1. SSPC-SP3 Power Tool Cleaning.

1.5 SUBMITTALS

- A. Manufacturer's product data.
- B. Manufacturer's installation instructions.
- C. Shop Drawings: Indicate information on shop drawings as follows:
 1. Stair plans, elevations, details, methods of installation and anchoring.
 2. Show members, sizes and thickness, anchorage locations and accessory items.
 3. Furnish setting diagrams for anchorage installation as required.
 4. Include calculations stamped by a structural engineer registered in the jurisdiction in which the project is located.
- D. Samples: Submit as follows:
 1. Two samples, minimum size 6 inches (152 mm) square, representing actual product, finish and patterns for each finished tread product specified.
- E. Information Submittals:
 1. Submit listed submittals in accordance with Contract Conditions and Section 01300
 2. Submit manufacturer's storage and installation instructions.
 3. Submit documentation verifying that components and materials specified in this Section are from single manufacturer.
 4. Qualification Statements:
 - a. Submit certificate verification that manufacturer is American Institute of Steel Construction (AISC) Certified for Standard Steel Building Structures.
 - b. Submit letter of verification for Installer's Qualifications.

1.6 DELIVERY AND HANDLING

- A. Delivery and Acceptance Requirements:
 - 1. Deliver material in accordance with Section - 01300 and in accordance with manufacturer's written instructions.
 - 2. Deliver materials in manufacturer's original packaging with identification labels intact and in sizes to suit project.
- B. Storage and Handling Requirements:
 - 1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

PART 2 PRODUCTS

2.1 METAL STAIRS

- A. Design Criteria:
 - 1. Structural Performance of Stairs: Stairs shall withstand the following structural loads without exceeding the allowable design working stress of materials, including anchors and connections. Apply each load to produce the maximum stress in each component:
 - a. Treads and Platforms of Metal Stairs: Capable of withstanding a uniform load of 100 psf (4.8 kN/m²) and concentrated load of 300 lbf (1.33 kN) applied on an area of 4 square inches (2581 square mm). Concentrated and uniform loads need not be assumed to act concurrently.
 - b. Stair Framing: Capable of withstanding stresses resulting from loads specified, in addition to stresses resulting from railing system loads.
 - c. Limit Deflection of Treads, Platforms and Framing Members: To L/240.
 - 2. Structural Performance of Handrails and Railings: Handrails and railings shall withstand the following structural loads without exceeding the allowable design working stress of materials, including handrails, railings, anchors and connections.
 - a. Top Rail of Guardrail: Capable of withstanding a concentrated load of 200 lbf (0.89 kN) applied in any direction and a uniform load of 50 psf (2.39 kN/m²) applied in any direction. Concentrated and uniform loads need not be assumed to act concurrently.
- B. Standard Stair and Rail System:
 - 1. Manufacturer's standard prefabricated, pre-engineered straight run stair and landing system, consisting of hot rolled steel sheet stringers, risers, treads, landings, fasteners/supports and railings.
 - a. Stringers:
 - i. Steel plate or channel with side mounted prefabricated railings.
 - ii. Minimum thickness or gage as determined by structural design calculations, structural grade steel plate or channel.

2. Risers: Closed riser, minimum 14 gage (1.9 mm) hot rolled mild steel sheet, sloped maximum 1 1/2 inches (38.1 mm) and conforming to Americans with Disabilities Act (ADA) nosing requirements.
3. Treads: Manufacturer's standard concrete pan system, field poured. Tread pans to be minimum of 14 gage (1.9 mm), or as determined by design calculations. Pan depth 1 1/2 inches (38.1 mm). Exposed welds from the bottom side of flight assemblies will not be allowed. All welds to be from topside of tread pans as recommended by manufacturer.
4. Mid Landings: Minimum of 12 gage (2.7 mm) hot-rolled mild steel sheets, formed for a minimum 2 1/2 inches (64 mm) concrete fill, with 11 gage channel supports and bracing welded to perimeter frame at 12 inches (305 mm) on center.
5. Fasteners and Supports: Sized by the manufacturer to meet structural design criteria. If hanger rod connections are applicable to any of the landing connections, they shall be a minimum of 5/8 inch (15.9 mm) diameter steel rod, with actual size based on stair load.
6. Manufacturer's standard welded steel tube railing system complying with the following requirements:
 - a. Rails: 1 1/2 inches (38.1 mm) diameter x 13 gage (2.3 mm) minimum round steel tube, continuous multi-strand type, equally spaced with not more than 3 15/16 inches (100 mm) clearance between strands and with a minimum extension per code at top and bottom risers. Wrap rail continuously past

space between flights to form guardrail as required by building code. Terminate rail ends with radiused returns, newel posts or safety terminations approved by local code. Provide not less than 1 1/2 inches (38.1 mm) clearing between rail and wall.
 - b. Rail Posts: 1 1/2 inches (38.1 mm) square x 11 gage (3 mm) tubing. Rail posts to fasten to side of plate stringers per manufacturer's shop drawings. Manufacturer to pre-weld erection aid to rail post for proper height to aid stair erector. Erection aid (setting block) to be removed and weld-ground smooth after installation.
 - c. Fabrication:
 - i. Use preformed or prefabricated bends.
 - ii. Butt weld tee and cross intersections in tubing. Cope and weld intersections in pipe. Miter elbows.
 - iii. Mechanically fasten internal sleeves and fittings.
 - iv. Provide minimum 12 gage (2.7 mm) welded steel plate closures or hemispherical closure fittings on all exposed rail ends.

- C. Custom Stair and Rail System:
1. Support System: Provide landing support with manufacturer's standard system.
 - a. Hanger rod landing supports.
 - b. Tube strut landing supports.
 - c. Shelf angle landing supports.
 - d. Knock-down (KD) landing supports.
 2. Rail System: Provide rail system
 - a. Standard 34 inch (864 mm) height handrail system with 42 inch (1067 mm) guardrails at landings and openings.
 - i. Rail Type: Picket style rail
 3. Tread Construction:
 - a. Tread with factory applied abrasive filled epoxy, 3/8 inch (9.5 mm) thick, 8000 psi (55,158 kPa) compressive strength.
 - b. Factory applied slip- and wear-resistant abrasive epoxy coating applied directly to flat steel treads.
 - c. Slip-resistant checkered floor plate treads.
 - d. Tread with 1 1/2 inch (38.1 mm) thick, 5000 psi (34,474 kPa) compressive strength, natural concrete color with broom finish.
 - e. 1 1/2 inch (38.1 mm) pan type treads for field-poured concrete.
- D. Materials:
1. Steel Shapes and Plates: To ASTM A36.
 2. Steel Pipe: To ASTM A53 Type E or S, Grade B.
 3. Steel Tubing:
 - a. Structural Use: To ASTM A500, Grade B or C.
 - b. Non-Structural Use: To ASTM A513, hot rolled or coiled rolled (mill option).
 4. Steel Sheet:
 - a. Structural Use: To ASTM A1011 (hot rolled).
 - b. Non-Structural Use: To ASTM A786, ASTM A1008.
 5. Fasteners: As recommended by manufacturer.
 6. Welding Rods: In accordance with AWS code and AWS filler metal specifications for material being welded.
 7. Primer: HAPS-free, solvent-based, rust inhibitive primer containing less than 3.5 lb/gal (1.6 kg/L) Volatile Organic Compounds (VOC) and compatible with conventional alkyds topcoats.
- E. Fabrication:
1. Use same material and finish as parts being joined. Use stainless steel between dissimilar metals and non-corrosive fasteners at exterior connections or joints.

2. Provide fasteners of sufficient strength to support connected members and loads, and to develop full strength of parts fastened or connected.
3. Construct stairs and rails with all components necessary for support and anchorage, and for a complete installation.

F. Finishes

1. Rails and Stair Components: Completely remove oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter from steel surface in accordance with SSPC SP3.
2. Shop primer immediately after fabrication and cleaning, spray apply primer to dry film thickness recommended by primer manufacturer, but not less than 2.0 mil thickness. Apply one coat High Solids Red Oxide Anticorrosive primer meeting SSPC-15 Paint.

G. Accessories

1. Nosing Insert: Manufacturer's factory filled pan with integral self-illuminating nosing meeting NYC Reference Standards RS 6-1 and RS-1A.
2. Anchor bolts, clip angles, hanger rods, hardware and incidental materials required for complete installation, as recommended by the manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to metal stair and railing installation.
1. Inform Owner and Consultant of unacceptable conditions immediately upon discovery.
 2. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval from Owner and Consultant.

3.2 PREPARATION

- A. Obtain the Engineers approval to install prior to installation.
- B. Ensure structure or substrate is adequate to support metal stairs and railings. Ensure new concrete has completely cured prior to installation.
- C. Contractor shall protect concrete against all damage and markings

3.3 INSTALLATION

- A. Coordinate metal stairs and railings work with work of other trades for proper time and sequence to avoid construction delays.
- B. Install stairs, landings and handrails in accordance with manufacturer's instructions. Install square, plumb, straight and true to line and level, with neatly fitted joints and intersections.

- C. Do not cut or alter structural components without written authorization.
- D. Field welding and joining shall conform to AWS D1.1 and AWS D1.3
- E. Do not cut or alter structural components without written authorization.
- F. Grind all exposed welds smooth and touch-up shop-primed areas with same primer as used by Manufacturer
- G. Adjust components and systems for correct function and operation in accordance with manufacturer's written instructions.

END OF SECTION