



STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

February 17, 2010

UTILITY TUNNEL ENTRY/EXIT HATCHWAYS

SOUTHERN UTAH UNIVERSITY

CEDAR CITY, UTAH

DFCM Project Number 09116730

Stanley Consultants, Inc.
383 West Vine Street, Suite 400
Murray, Utah 84123
801-293-8880

TABLE OF CONTENTS

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

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at <http://dfcm.utah.gov/StdDocs/index.html> "Standard Documents" – "Reference Documents I" – "Item 6. Supplemental General Conditions" or are available upon request from DFCM:

DFCM Supplemental General Conditions dated July 1, 2009 *

DFCM Supplemental General Conditions dated July 15, 2008

DFCM General Conditions dated May 25, 2005

DFCM Application and Certification for Payment dated May 25, 2005.

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

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

NOTICE TO CONTRACTORS

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

UTILITY TUNNEL ENTRY/EXIT HATCHWAYS
SOUTHERN UTAH UNIVERSITY – CEDAR CITY, UTAH
DFCM PROJECT NO: 09116730

Bids will be in accordance with the Contract Documents that will be available on **Wednesday, February 17, 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 Jeff Reddoor, DFCM, at 801-971-9830. No others are to be contacted regarding this bidding process. The construction estimate for this project is \$ 90,600.00

A **mandatory** pre-bid meeting will be held at **1:00 P.M. on February 24, 2010** at Southern Utah University – Facility Management Building, 385 S. 1275 W. Cedar City, Utah. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of **2:30 PM on March 10, 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

Replace existing tunnel manhole covers with new spring loaded hatchway door assemblies. Aprox. 12 total assemblies.

(6) Deep hatchways as base bid

(6) Shallow as alternates

**PROJECT SCHEDULE**

**PROJECT NAME: Utility Tunnel Entry/Exit Hatchways - Southern Utah University
Cedar City, Utah
DFCM PROJECT NO. 09116730**

Event	Day	Date	Time	Place
Bidding Documents Available	Wednesday	February 17, 2010	1:00 PM	DFCM 4110 State Office Bldg SLC, UT and the DFCM web site *
Mandatory Pre-bid Site Meeting	Wednesday	February 24, 2010	1:00 PM	SUU-Facility Mngt. Bldg. 385 S 1275 W. Cedar City, Utah
Last Day to Submit Questions	Wednesday	March 3, 2010	1:00 PM	<i>Jeff Reddoor</i> – DFCM E-mail jreddoor@utah.gov Fax 435-743-6624
Addendum Deadline (exception for bid delays)	Thursday	March 4, 2010	3:00 PM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Wednesday	March 10, 2010	2:30 PM	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Thursday	March 11, 2010	2:30 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	July 30, 2010	12:00 Noon	

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



Division of Facilities Construction and Management

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 Utility Tunnel Entry/Exit Hatchways - Southern Utah University - Cedar City, Utah - DFCM Project No. 09116730 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:

BASE BID:

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

ADDITIVE ALTERNATE #1 Vault 5

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

ADDITIVE ALTERNATE #2 Vault 6

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

ADDITIVE ALTERNATE #3 Vault 8

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

ADDITIVE ALTERNATE #4 Vault 9

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

ADDITIVE ALTERNATE #5 Vault 10

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

ADDITIVE ALTERNATE #6 Vault 12

_____ DOLLARS (\$ _____)

(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by July 30, 2010, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **\$100.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

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

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

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

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

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable 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 found in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the contract sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for subcontractors will be specified in the Supplementary General Conditions.

4. Listing of Subcontractors

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

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

5. Interpretation of Drawings and Specifications

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

6. Addenda

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

7. Award of Contract

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

8. DFCM Contractor Performance Rating

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

9. Licensure

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

10. Permits

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

11. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

12. Time is of the Essence

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

13. Withdrawal of Bids

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

14. Product Approvals

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

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

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

16. Debarment

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

**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.

GROUNDS FOR DISQUALIFICATION:

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

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM
Page No. 2

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 #

We certify that:

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

FIRM: _____

DATE: _____

SIGNED BY: _____

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

CONTRACTOR'S AGREEMENT

FOR:

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

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

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

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

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

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

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

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

CONTRACTOR'S AGREEMENT
PAGE NO. 2

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: _____ (Seal)

Attorney-in-Fact

STATE OF _____)
) ss.
COUNTY OF _____)

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

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

My commission expires: _____

Resides at: _____

NOTARY PUBLIC

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

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

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. 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: <small>(ABC Construction, John Doe, 111-111-1111)</small>	A/E: <small>(ABC Architects, Jane Doe, 222-222-2222)</small>	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>	

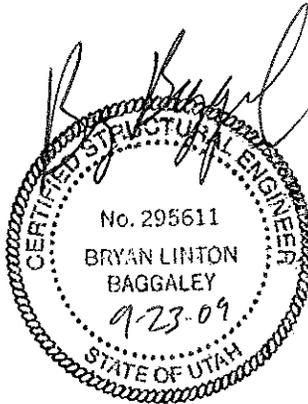
Signed by:	Date:	Mean Score
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Additional Comments:

Project Manual

for

Southern Utah University Utility Tunnel Entry / Exit Hatchway Upgrade DFCM Project No.: 09116730



Issued for Construction
September 2009



State of Utah—Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION
AND MANAGEMENT

4110 State Office Building/Salt Lake City, Utah 84114/638-3018



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DFCM Project No.: 09116730
Utility Tunnel Entry / Exit Hatchways

Division of Facilities Construction and Management
Southern Utah University
Cedar City, Utah

Resp. Charge	Section	Title	Page
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SPECIFICATIONS GROUP

GENERAL REQUIREMENTS SUBGROUP – See Drawing GG2

FACILITY SERVICES SUBGROUP

DIVISION 03 CONCRETE

03 00 10	Concrete Work	1 thru 8
03 40 00	Precast Concrete	1 thru 7

DIVISION 05 METALS

05 50 00	Metal Fabrications	1 thru 4
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DRAWING LIST	1 thru 1
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DRAWINGS	Bound Herein
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Drawing No.	Title	Rev. No.
GG1	Title Sheet & Sheet Index	0
GG2	Overall Partial Site Plan – Vault Locations	0
SG1	General Structural Notes Sheet 1	0
SG2	General Structural Notes Sheet 2	0
SP1	Manhole Lid and Vault Information Sheet 1	0
SP2	Manhole Lid and Vault Information Sheet 2	0
SP3	Manhole Lid and Vault Information Sheet 3	0
SD1	Structural Details	0

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cast-in-place concrete including formwork, reinforcing steel and miscellaneous materials.

1.02 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 117 and 301.
- B. Maintain copy of ACI117, 301 and SP-15 in field office at all times.
- C. OWNER will retain services of qualified independent testing laboratory. Responsibility of testing laboratory will include:
 - 1. Obtaining, making samples, and performing laboratory and field-testing specified.
 - 2. Provide reports to ENGINEER giving information on materials and testing performed.
 - 3. Reports shall indicate whether or not materials meet specifications.
- D. Perform Work in accordance with ACI 117 and 301.
- E. Tests:
 - 1. Establish proposed concrete design mix proportions on basis of either field experience and/or trial mixtures in accordance with ACI 318, Chapter 5, except specific requirements shall conform to requirement of these specifications. Determine and submit supporting data, standard deviation, trial batch tests, required average strength, proportions, air content, and slump range for each mix.
 - 2. Concrete strength tests:
 - a. Comply with ASTM C39 for testing and ASTM C31 or C192 for preparation of cylinders.
 - b. Field tests: Sample in accordance with ASTM C172; make and test 4 cylinders from each sample, 5 cylinders for walls and elevated slabs, on basis of not less than:
 - 1) One sample from each day's placement for each class of concrete.
 - 2) One sample from the first 20 cu yd of each day's placement.
 - 3) One sample from each 50 cu yd.
 - 4) For a given class of concrete, if frequency of testing specified above would provide less than 4 samples, sample at least 4 randomly selected batches or each batch if 4 batches or fewer are required.
 - c. 4 of the 5 test cylinders for walls and elevated slabs, and 3 of the 4 test cylinders for other work, shall be laboratory cured, with one cylinder cured under field conditions. Test the field cylinder at 3 or 4 days to determine if the concrete has attained at least 2/3 of the specified 28-day strength and it is safe to strip the forms. Test one laboratory cured cylinder at 7 days and other two at 28 days for average strength. The final cylinder shall be held in reserve to be tested as directed by ENGINEER.
 - d. If tests indicate deficient strength as defined by ACI 318, immediately adjust mix to increase average of subsequent test results and, when directed, perform drilled core testing, ASTM C42. Testing and remedial work shall be at no additional cost to OWNER.
 - 3. Slump tests:
 - a. Test each batch as delivered; comply with ASTM C172 and C143.
 - b. If slump exceeds Specifications, promptly remove batch from Work and dispose of off-site at location selected by CONTRACTOR. Do not add water in excess of specified water-cement ratio to batch to achieve desired slump.
 - 4. Air content tests:
 - a. Sample on basis specified above for field strength tests.
 - b. Obtain samples from concrete after it has been placed and consolidated.
 - c. Determine air content by pressure method; comply with ASTM C231.
 - d. If air content does not meet Specifications, remove deficient concrete from Work.
 - 5. Aggregate Tests:

- a. Comply with ASTM C33 for grading, deleterious substances, and soundness.
- b. Gradation: Each 200 tons.
- c. Deleterious substances and soundness: Each change in source from which aggregate is taken.
- d. Change in strata will be considered a change in source.

1.03 SUBMITTALS

- A. Proposed concrete design mixes. Submit standard deviation, required average strength, proportions, and slump of each mix. See article "Concrete Design and Use". Submit minimum of 7 days prior to commencing concrete placement.
- B. Tests, or certificates of compliance with standards specified in this Section at least 14 days prior to commencing concrete placement for:
 1. Cement: From each car from which cement will be used.
 2. Fly ash: From each separate shipment from which fly ash is being used.
 3. Aggregates: For each size aggregate from each source of aggregate, for grading, deleterious substances and soundness.
- C. Shop Drawings on reinforcing steel.
- D. List of admixtures, joint fillers, sealants, curing compounds, and other manufactured materials proposed identifying manufacturer and type. Provide data on specific items when requested by ENGINEER.
- E. Testing laboratory reports required at least 14 days prior to commencing concrete placement for each class of concrete and each size aggregate:
 1. Proposed concrete design mix.
 2. Tests on concrete cylinders from trial batch of proposed mix.
- F. Testing laboratory reports for tests on concrete cylinders taken in field.

1.04 STORAGE OF MATERIALS

- A. Cement: Keep clean, dry, and free from weather damage.
- B. Aggregates: Stockpile each gradation separately on clean, noncontaminating surface.

PART 2 PRODUCTS

2.01 CEMENT

- A. Portland cement: ASTM C150, Type I.
- B. High-early-strength portland cement: ASTM C150, Type III. May be used instead of Type I cement at CONTRACTOR's option, unless specified otherwise, to achieve 28-day strength at 7 days.
- C. Use only 1 brand of each type of cement.

2.02 AGGREGATE

- A. Regular aggregate: Strong, durable, well-graded minerals conforming to ASTM C33 requirements for grading, deleterious substances, and soundness.
- B. Aggregates not conforming exactly to above specifications may be used provided:

1. Special tests or actual service establish that such aggregates will produce concrete of quality specified.

C. Coarse aggregate nominal size:

1. 1-1/2" to No. 4: Use for all concrete unless specified otherwise.
2. 3/4" to No. 4: Use for slabs and thin sections and areas where clear spacing between reinforcing bars is less than 3".

2.03 WATER

- A. Clean, fresh, free from injurious amounts of oil, alkali, acid, salts, organic materials, or other substances that may be deleterious to concrete or steel.

2.04 ADMIXTURES

- A. Water-reducing and set-controlling admixture, ASTM C494, type as required. Use for all concrete. High range, water-reducing admixtures permitted for walls.

2.05 FORMS

A. Acceptable materials:

1. Douglas fir, exterior type, concrete form plywood, 5/8" thick minimum, conforming to DOC PS 1, Grade B-B, Class I or II.
2. Removable metal and plywood forms equal to symons.
3. Fiber tube forms: Cylindrical reinforced fiberglass.

- B. Form ties: Type leaving no metal within 1/4" of surface after removal of forms for surfaces receiving waterproofing.

C. Form coating:

1. Wood forms: Nonstaining mineral oil or commercially produced form-release agent that will not bond with, stain, or adversely affect concrete surfaces and curing, and will not impair bond or adhesion of subsequent treatment of concrete surfaces, "Nox-Crete Form Coating," by Nox-Crete Chemicals, or equal.
2. Metal forms: Treat surfaces as recommended by manufacturer before placing reinforcing.
3. Fiber tube forms: Treat surfaces as specified for wood forms or as recommended by manufacturer.

2.06 CURING MATERIALS

A. Liquid membrane-forming compound:

1. ASTM C309, Type 1 with fugitive dye, except Type 2 with white pigment for surfaces exposed to direct rays of sun.
2. Do not use compounds containing wax, oil, resin, varnish, or other bases that will prevent bonding of finishes such as additional concrete, paint, and similar applied finishes.
3. Use for curing at CONTRACTOR's option except where other products are specified for particular application.

B. Plastic film:

1. Polyethylene plastic film, white, nonstaining, conforming to ASTM D2103.
2. Minimum 4-mil thickness.
3. Use for curing at CONTRACTOR's option except where other products are specified for particular application.

- C. Absorptive mat:
1. Cotton fabric, burlap fabric, or burlap-polyethylene material woven or bonded to prevent separation.
 2. Material shall be clean and nondetrimental to concrete or finish.
 3. Use for curing at CONTRACTOR's option except where other products are specified for particular application.

2.07 CONCRETE DESIGN AND USE

- A. Each concrete design mix shall be established in strict accordance with ACI 318 by proportioning on basis of either experience and/or trial mixtures.

B. Strength classifications:

Class	Specified Compressive Strength, f'c	Required Average Compressive Strength, f'cr
A	4,000 psi	5,200 psi

- C. Required average compressive strengths: Produce concrete of average strengths noted above unless test results substantiate a lower permissible average strength based on standard deviation criteria set forth in ACI 318. Strength listed above is 7-day strength for concrete using high-early-strength cement and 28-day strength for concrete using other type cements.

D. Maximum water-cementitious materials ratio by weight:

1. Class A concrete: 0.48.
2. Class B concrete: 0.55.
3. Class C concrete: 0.48

- E. Air entrainment: Concrete used above frost depth shall contain entrained air within following limits. All Class C concrete shall contain air entrainment.

Nominal Maximum Size of Coarse Aggregate, In.	Total Air Content, Percent By Volume
3/4"	4 to 8
1"	3.5 to 6.5
1-1/2"	3 to 6

F. Workability:

1. Proportions of concrete shall produce a mixture, suited to placement methods, which will work readily into corners and angles of forms and around reinforcement and embedded items. Segregation of materials or presence of free water will not be permitted.
2. Slump of concrete: 3" to 5" for Class A concrete; 3" to 6" for Class B concrete. Use minimum practical; vary within limits given to suit placement conditions; in no case is slump to be increased by addition of water in excess of design mix quantity.
3. At CONTRACTOR's option, tunnel walls may be constructed using flowable concrete containing superplasticizers.

G. Concrete use:

1. Use Class A concrete for all concrete except as specified herein or shown otherwise on Drawings.

2.08 READY-MIX CONCRETE

- A. Provide concrete from an established, approved ready-mix plant. Ready-mix plant equipment and facilities shall be certified in accordance with NRMCA QC-3.
- B. Equipment and methods: Conform to ASTM C94.

2.09 MEASURING

- A. Ingredients:
 - 1. Cement: By weight or bag.
 - 2. Aggregate: By weight.
 - 3. Water: By weight or volume.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Construct forms strong, straight, adequately braced and securely fastened.
- B. Remove laitance from previously placed or existing concrete; thoroughly clean surface before placing additional concrete.
- C. Apply form coating on formwork in accordance with manufacturer's instructions. Apply prior to placing reinforcing steel, anchoring devices, and embedded items.

3.02 PLACING CONCRETE

- A. Clean transporting equipment, reinforcing, and embedded items before placing concrete. Remove water and debris from places to be occupied by concrete.
- B. Place no concrete until forms, reinforcing, and embedded items have been verified as adequately supported and accurately placed. Place no concrete over water-covered, muddy, or frozen soil.
- C. Where conditions make placement or consolidation difficult or where reinforcement is congested, batches of mortar containing same proportions of cement, sand, and water as used in concrete shall be deposited in forms around congestion immediately prior to concrete placement to avoid segregation induced "honeycomb".
- D. Immediately remove concrete where water, soils, or other deleterious substances are permitted to mix with concrete, form or embedded item movement occurs, or inadequate consolidation is obtained.
- E. Hot weather concreting:
 - 1. Applies to concrete placed when ambient temperature exceeds 90°F.
 - 2. Conform to ACI 305R recommendations and requirements.
- F. Cold weather concreting:
 - 1. Applies to concrete placed when ambient temperature is below 40°F.
 - 2. Conform to ACI 306R recommendations and requirements.
- G. Employ best industry practices to prevent segregation during placing. Do not drop concrete more than 5'. Use tremied or pumped concrete to provide proper placement. Place in layers approximately 18" deep.

- H. Place concrete continuously in each section until completed. Permit not more than 30 minutes between depositing adjacent layers of concrete within each section, unless an acceptable set retarder is used in concrete mix.
- I. Thoroughly compact, puddle, and vibrate concrete into corners and around reinforcing and embedded items. Use internal vibration where size of section permits.
- J. Maintain concrete placing temperature between 50°F and 90°F except as specified for hot and cold weather concreting.
- K. Place sections of concrete in sequence that eliminates shrinkage effects to greatest extent practicable.
- L. Protect concrete from injury due to sun, cold weather, running water, construction operations, and other causes until properly cured.

3.03 REINFORCEMENT PLACEMENT

- A. Remove scale, loose flaky rust, dirt, grease, curing compound, and other coatings that would impair bond.
- B. Install slab reinforcing bars in correct position by use of preformed bolsters and spacers, except concrete blocks may be used to position bars in concrete placed on grade. Concrete block shall have compressive strength equal to that of surrounding concrete.
- C. Space bars properly and tie securely in position before placing concrete. Tack welding to keep reinforcing in place is not permitted.
- D. Lap wire fabric not less than 8".

3.04 INSPECTION

- A. Verify reinforcement and other items to be cast in concrete are properly placed and secured.
- B. Verify opening, recesses, and similar variations to concrete shape are formed and secured.
- C. Verify concrete may be placed without resulting in voids and honeycomb areas. Make provisions for release of trapped air.
- D. Verify forms are securely braced and tied.
- E. Verify elevations and dimensions are accurate.

3.05 EMBEDDED ITEMS

- A. Install items required under this contract to be embedded in concrete. Install items required by others for embedding in concrete, if so instructed before placing concrete.
- B. Fasten embedded items securely in proper position before placing concrete.
- C. Conduit or pipe embedded in slabs or walls:
 - 1. Locate in center of slab or wall and space not closer than 3 diameters on center; locate to avoid impairing strength of concrete.
 - 2. Coordinate placing of reinforcing with conduit or pipe location. Do not cut reinforcing to clear conduit or pipe.

- D. Aluminum pipe shall not be embedded in concrete. Where aluminum projects into or rests against surface of concrete, coat surfaces of aluminum to prevent direct contact with concrete.

3.06 FINISHING

A. Flatwork:

1. Tamp concrete to force coarse aggregate down from surface.
2. Screed with straightedge, eliminate high and low places, bring surface to required finish elevations; slope uniformly to drains.
3. Dusting of surface with dry cement or sand during finishing operations is not permitted.
4. Finish surfaces within following tolerances as measured with a 10' straightedge:
 - a. Sidewalks: 5/16".
 - b. Other slabs: 3/16".
 - c. Top surfaces of structures other than slabs: In accordance with ACI 117.
5. Finish:
 - a. Float surface to true, even plane.
 - b. Finish surface to match existing surrounding sidewalk.

B. Formed surfaces:

1. Remove fins, projections, and loose material.
2. Clean surfaces of form oil.
3. Patch honeycomb, aggregate pockets, voids, and holes as follows:
 - a. Chip out until sound concrete is exposed to minimum depth of 1".
 - b. Prepare patching mortar with approximately 2 parts normal portland cement, one part white cement, 9 parts fine aggregate; vary proportions of cement as necessary to match color of adjacent concrete.
 - c. Saturate surfaces with water and fill cavities with patching mortar.
4. Fill holes left by form ties with patching mortar.
5. Cure patches as specified for concrete.

3.07 FORM REMOVAL

A. Minimum time before removal after placing concrete, unless permitted otherwise:

1. Self-supported beams and slabs: 7 days; prior to that if field cured cylinder test yields 2/3 of the design concrete compressive strength.
2. Time specified above represents cumulative time during which temperature of concrete is maintained above 50°F and for concrete without set-controlling admixtures.

B. Reduce removal time by half for high-early-strength cement concrete.

C. In any event, do not remove supporting forms and shoring until concrete has acquired sufficient strength to prevent damage to new concrete.

3.08 CURING

A. Cure all concrete; begin curing as soon as possible after placement of concrete.

B. Use liquid membrane-forming compound curing for floor slabs; method of curing optional for other concrete.

C. Plastic film curing:

1. Dampen surface of concrete and lay plastic film with minimum 6" side laps and free of wrinkles; tape side laps.
2. Hold film in place with lumber or use similar provisions to prevent exposure of concrete for 7 days after placing.
3. Immediately repair tears in film.

D. Water curing:

1. Keep concrete continuously wet for 7 days after placing.
2. Use on concrete surfaces not receiving compound or plastic film curing.
3. Clean, nonstaining absorptive mat may be used with water curing.
4. Do not use for curing cold weather concrete.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural precast concrete
- B. Connection and supporting devices.
- C. Design of precast concrete, casting, inserts where shown on Drawings, prestressing, finishing, transportation, and erection.

1.02 COORDINATION

- A. Coordinate Work of framing components not precast but associated with Work of this Section.
- B. Coordinate location of hanger tabs and devices for mechanical and electrical work.

1.03 PRE-INSTALLATION MEETING

- A. Convene minimum 1 week prior to commencing work of this Section.
- B. Discuss anchor and weld plate locations, sleeve locations, and cautions regarding cutting or core drilling.

1.04 INFORMATIONAL SUBMITTALS

- A. Product Data: List of manufactured materials proposed, identifying manufacturer and type and manufacturer's technical information on lifting devices.
- B. Quality assurance data:
 - 1. Tests or certificates of compliance for reinforcing steel.
 - 2. Welder's qualifications.
 - 3. Submit design data reports indicating calculations for loadings and stresses of fabricated, designed framing and connections, signed and sealed by professional engineer.

1.05 ACTION SUBMITTALS

- A. Shop Drawings and Engineering Calculations of precast members, showing layout, fabrication details, unit locations, sizes, reinforcement, embedment locations, anchorage devices, openings, lifting locations, cast-in items, design loads, deflections, and cambers. Drawings and calculations shall be stamped by a professional engineer licensed in the state of Utah.

1.06 SUSTAINABLE DESIGN SUBMITTALS

- A. Product Data:
 - 1. Recycled content:
 - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
 - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
 - c. If recycled content product is part of assembly, indicate percentage of recycled content product in assembly by weight.
 - d. If recycled content product is part of assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
 - 2. Local/regional materials:

- a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and project site.
 - b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and project site.
 - c. Product value: Indicate dollar value of product containing local/regional materials; include materials cost only.
 - d. Product component(s) value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate percentage by weight of each component per unit of product.
3. List of manufactured materials proposed, identifying manufacturer and type and manufacturer's technical information on lifting devices.

1.07 QUALITY ASSURANCE

- A. Perform Work in accordance with requirements of PCI MNL-116S, PCI MNL-123, PCI MNL-120.
- B. Qualifications:
 1. Fabricator: Company specializing in performing Work of this section with minimum 3 years documented experience.
 2. Erector: Company specializing in erecting Work of this section approved by manufacturer.
 3. Design precast concrete members under direct supervision of professional engineer experienced in design of this Work and licensed in State of Utah.
 4. Welder: Qualified within previous 12 months for types of welds indicated, in accordance with AWS D1.1, AWS D1.4, and AWS B2.1.
- C. Regulatory requirements: Design precast members in accordance with:
 1. PCI MNL-120 - Design Handbook.
 2. PCI MNL-124 - Design for Fire Resistance of Precast Prestressed Concrete.
 3. ACI 318 (ACI 318M) Building Code Requirements for Structural Concrete.
 4. ACI 301 - Specifications for Structural Concrete.
 5. Design connections in accordance with PCI MNL-123 - Manual on Design of Connections for Precast Prestressed Concrete.
- D. Produce precast members in accordance with requirements of PCI MNL-116S. Maintain plant records and quality control program during production of precast members. Make records available upon request.
- E. Maintain 1 copy of following documents on site:
 1. All shop drawings with reviewers comments.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Precast members shall be lifted and supported during transportation as required by design. Lifting points shall be shown on Shop Drawings, and lifting devices shall be embedded in members by manufacturer.
- B. Handle precast members in position consistent with their shape and design. Lift and support only from support points.
- C. Lifting or handling devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
- D. Protect members to prevent staining, chipping, or spalling of concrete.
- E. Mark each member with date of production and final position in structure.

- F. Deliver in proper sequence in order that installation may commence upon delivery. Owner will not be responsible for storing precast concrete in event delivery is prior to time it can be installed.

PART 2 PRODUCTS

2.01 DESIGN REQUIREMENTS

- A. Design components to withstand soil loads, dead loads and live loads and lateral loads.
 - 1. Roof Assembly: 250 psf min live load or AASHTO H20 traffic load plus dead weight of soil on top of assembly.
 - 2. Concentrated loads as indicated on Drawings.
- B. Design precast concrete and attachments for fabrication, transportation, and erection as well as temperature, axial, and wind and seismic stresses as applicable.
- C. Seismic design: Design and detail elements and connections to resist seismic force in accordance with ACI 318 (ACI 318M) and IBC 2006 code requirements.
- D. Design members exposed to weather to allow movement of components without damage, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to seasonal or cyclic day/night temperature ranges.
- E. Design components to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.
- F. Maximum allowable deflection:
 - 1. Roof members: L/480 span.
- G. Design system to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.
- H. Calculate structural properties of framing members in accordance with ACI 318 (ACI 318M).
- I. Design of precast concrete shall be performed by a professional engineer registered in state of Utah with experience in precast concrete design. Calculations and drawings shall be sealed by registered engineer in state of Utah.
- J. Design precast concrete to be supported as shown on Drawings. If size of precast member used is different than shown, revise support elevations and details as required at no cost to Owner.

2.02 MATERIALS

- A. Concrete compressive strength shall be as required by design, but strength at 28 days shall be not less than 4,000 psi. Use minimum water/cement ratio and slump consistent with placement requirements.
- B. Aggregate, sand, water, admixtures: Determined by precast fabricator, as appropriate to design requirements.
- C. Cement: portland, ASTM C150 Type I.
- D. Aggregate: ASTM C33.
 - 1. Fine aggregate: Clean, sharp natural sand.
 - 2. Coarse aggregate:
 - a. Crushed stone, processed from natural rock or stone.
 - b. Maximum size: Not more than 1/5 of narrowest dimension, 1/3 depth of slabs, nor 3/4 minimum clear spacing between reinforcing bars or strands.

- E. Water: Clean, free from injurious amounts of oil, alkali, acid, or organic matter.
- F. Admixtures:
 - 1. Water-reducing, retarding, accelerating, high-range water reducing admixtures: ASTM C494/C494M.
 - 2. Air entraining agent, ASTM C260. Use in accordance with manufacturer's recommendations.
 - 3. Use of calcium chloride or other salts is not permitted.
- G. Reinforcing steel: ASTM A615/A615M, deformed steel bars.
- H. Welded steel wire fabric: ASTM A185 Plain Type
- I. Chairs: Hot-dip galvanized and plastic coat chairs or positioning devices in contact with faces of precast concrete.
- J. Embedded items:
 - 1. Standard bolts: ASTM A307.
 - 2. Miscellaneous plates and shapes: ASTM A36/A36M.
 - 3. Hot-dip galvanizing: ASTM A153/A153M.
- K. Forms: Metal or other substantial material to produce concrete of required shapes, profiles, and finish.
- L. Hanger tabs and ferrous metal hangers shall be field painted with epoxy paint
- A. Load bearing and nonload-bearing AAC elements: Comply with ASTM C1386.

2.03 ACCESSORIES

- A. Neoprene bearing pads:
 - 1. Material: Elastomeric compound of not less than 60% by volume of neoprene.
 - 2. Durometer hardness: 50 5 in accordance with ASTM D2240.
 - 3. Tensile strength: 2,250 psi (15.5 MPa) minimum in accordance with ASTM D412.
 - 4. Tear strength: 180 lb/in (2.6 kN/m) minimum in accordance with ASTM D624.
 - 5. Compression set, 22 hours at 158°F (70°C): 25% maximum in accordance with ASTM D395.
 - 6. Use: At support points of precast members where shown on Drawings.
- B. Connecting and supporting devices:
 - 1. ASTM A36/A36M carbon steel hot-dip galvanized in accordance with ASTM A153/A153M
 - 2. Plates, angles, inserts cast into concrete shall conform to PCI MNL-123.
 - 3. Do not paint surfaces in contact with concrete or surfaces requiring field welding.
- C. Bolts, nuts and washers: High-strength steel type recommended for structural steel joints
- D. Prime paint: Zinc-rich, alkyd-type.
- E. Nonshrink grout: Nonmetallic, minimum compressive strength of 10,000 psi at 28 days.
- F. Cement grout: Minimum compressive strength of 3,000 psi (21 MPa) at 28 days.
- G. Grout: Use as required for grouting edges of roof members. "Five Star Grout" by U. S. Grout Corporation; "Masterflow 713 Grout" by Master Builders; or "V-I Grout" by W. R. Meadows, Inc.

2.04 FABRICATION

- A. Fabrication procedure shall conform to PCI MNL-116S.

- B. Maintain plant records and quality control program during production of precast members. Make records available upon request.
- C. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on Shop Drawings.
- D. Fabricate required openings with dimension larger than 8" (200 mm) and embed accessories provided by other Sections, at indicated locations. Openings smaller than 8" (200 mm) may be located and cut in field providing no prestressing strands are cut.
- E. Embed inserts required for roof hatches, and other construction into precast sections as required or shown on Drawings.
- F. Weld steel fabrications in accordance with AWS D1.1. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.
- G. Embed anchors, inserts, plates, angles, and other items at locations indicated.
- H. Connecting and supporting steel devices: Do not paint surfaces in contact with concrete or surfaces requiring field welding.
- I. Welding members and embedded items, where indicated on Drawings, shall be incorporated into precast members at time of fabrication.

2.05 FINISHES

- A. Plant finish: Finish members to PCI MNL-116S Standard Grade.
- B. Finish exposed-to-view finish surfaces of precast concrete members uniform in color and appearance.
- C. Cure members under identical conditions to develop required concrete quality, and minimize appearance blemishes including non-uniformity, staining, or surface cracking.

2.06 FABRICATION TOLERANCES

- A. Conform to PCI MNL-116S and PCI JR-307.
- B. Maximum Variation From Nominal Dimension:
 - 1. Width: 1/4"
 - 2. Length: 1/2"
- C. Thickness: 1/4"
- D. Maximum variation from intended camber: 1/4" in 10'
- E. Maximum out of square: 1/8" in 10' (3 mm in 3 m).
- F. Maximum misalignment of anchors, inserts, openings: 1/8" (3 mm)
- G. Maximum bowing of members: Length of bow divided by 360.

2.07 SOURCE QUALITY CONTROL AND TESTS

- A. Take concrete test cylinders for every 50 cu yd of concrete placed in accordance with ASTM C31/C31M.
- B. Take slump tests for every test cylinders in accordance with ASTM C143/C143M.

- C. Take one air entrainment test cylinders for each set of exterior concrete test cylinders taken.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify site conditions are ready to receive work and field measurements are as indicated on Shop Drawings.
- B. Verify supporting structure is ready to receive work.
- C. Each piece or unit of precast concrete when delivered shall have setting number marked clearly on unexposed edge.

3.02 PREPARATION

- A. Prepare support equipment for erection procedure, temporary bracing, and induced loads during erection.

3.03 ERECTION

- A. Embedded lifting devices in finished construction shall be removed to below concrete surface and grouted flush.
- B. Place, align, and level members in final position in structure on accepted bearing surfaces.
- C. Attach precast members to each other and to walls as shown on Drawings or Shop Drawings; welding shall be in accordance with requirements of AWS D1.1 including use of low-hydrogen electrodes for welding reinforcing.
- D. Field paint steel materials and touch up abrasions and welds on anchoring devices or structural steel with 1 coat of primer.
- E. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- F. Align and maintain uniform horizontal and vertical joints, as erection progresses.
- G. Maintain temporary bracing in place until final support is provided. Protect members from staining.
- H. Provide temporary lateral support to prevent bowing, twisting, or warping of members.
- I. Adjust differential camber between precast members to tolerance before final attachment.
- J. Adjust differential elevation between precast members to tolerance before final attachment.
- K. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers.
- L. Secure units in place. Perform welding in accordance with AWS D1.1.

3.04 ERECTION TOLERANCES

- A. Erect members level and plumb within allowable tolerances.
- B. Conform to PCI MNL-116S

- C. When members cannot be adjusted to conform to design or tolerance criteria, cease work and advise Engineer. Execute modifications as directed by Engineer.

3.05 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect members from damage caused by field welding or erection operations. Use noncombustible shields during welding operations to protect adjacent Work.
- B. Protect finish surfaces of precast concrete. Finish surfaces damaged during installation shall be repaired at no additional cost to Owner. For any repairs necessary, employ persons trained and skilled for that trade.
- C. Remove rubbish and debris resulting from delivery and installation from site. Do not allow to accumulate.

3.06 CLEANING

- A. Clean weld marks, dirt, or blemishes from surface of exposed members.
- B. Waste management:
 - 1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural fabrication and erection.
- B. Anchor rods.
- C. Expansion anchors.
- D. Welded studs.
- E. Shop painting.
- F. Field painting.

1.02 QUALITY ASSURANCE

- A. Perform welding in accordance with AWS D1.1 "Structural Welding Code" as applicable.
- B. OWNER will retain services of qualified, independent testing company to inspect fastener assemblies, and to perform inspection of welds.
- C. Where inspections indicate noncompliance with Contract Documents, repair or replace defective materials at CONTRACTOR's expense.
- D. Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication of Landscape Arbors.
- E. Shop Assembly: Pre-assemble Landscape Arbors in shop to greatest extent possible to minimize field slicing as assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.03 SUBMITTALS

- A. Shop Drawings for miscellaneous steel and ladders.
- B. Shop Drawings for Sidewalk Doors
- C. List of manufactured materials proposed, identifying manufacturer and type.
- D. Certified copies of mill tests.
- E. Welder's qualifications.

1.04 INSPECTION OF WELDS

- A. Inspection by OWNER's independent testing company: Visual inspection of shop and field welds in accordance with AWS D1.1.
- B. Repair welds shown by inspection to have discontinuities which would reduce weld strength in accordance with AWS D1.1. Cost of reworking and inspection shall be borne by CONTRACTOR at no additional cost to OWNER.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Structural Steel: ASTM A36.
- B. Miscellaneous steel plates and shapes: ASTM A36.
- C. Galvanizing: ASTM A123.
- D. Standard bolts: ASTM A307.
- E. High-strength bolts: ASTM A325, Type 1 only.

2.02 ANCHOR BOLTS

- A. Material: ASTM A307 or A36.
- B. Provide anchor bolt assemblies for:
 - 1. Structural steel furnished under this Section.
 - 2. Equipment and structures furnished by others, where detailed on Drawings.
- C. Provide washers and heavy hexagon heads and nuts on anchor bolts unless specified otherwise.
- D. Do not prime paint surfaces which are to be embedded in concrete.

2.03 ANCHOR RODS

- A. Type:
 - 1. All-threaded.
 - 2. Stainless steel: ASTM F593 (AISI 304).
- B. Anchor rods in concrete with 2-component blend of resin and hardener. Filler material may be mixed with resin and hardener in accordance with manufacturer's directions.
- C. Manufacturer:
 - 1. Vertical anchor rods installed in concrete from below: "HVA Adhesive" by Hilti, or equal.
 - 2. Horizontal anchor rods and vertical anchor rods installed in concrete from above: "HY-150 Adhesive System" by Hilti; "Epcon System" by ITW Ramset/Red Head; or equal.

2.04 EXPANSION ANCHORS

- A. Wedge-type with expanding cone, stainless steel.
- B. Size and locations: As shown or required for equipment installation.
- C. Manufacturer: "Wej-It" expansion anchor bolts, by Wej-It Expansion Products, Inc.; "Kwik-Bolt II" or "HSL Heavy-Duty Sleeve Anchors" by Hilti; or equal.

2.05 WELDED STUDS

- A. Material: ASTM A108.
- B. Type: "Nelson Fluxed Headed Anchor Studs," by Nelson Stud Welding Division, or equal.

- C. Automatically end weld in accordance with manufacturer's recommendations.

2.06 Access Hatch

- A. Material: Aluminum
- B. Size and locations: As shown on Drawings
- C. Manufacturer: Bilko or USF Fabrication INC or owner approved equal.

2.07 SHOP PAINTING

- A. Surface preparation: Remove oil, grease, dirt, rust, loose mill scale, and other foreign elements by "Power Tool Cleaning" in accordance with SSPC-SP3.
- B. Shop primer: Apply one shop coat of: "90-97 Tnemec-Zinc," by Tnemec Co., or equal; apply in accordance with manufacturer's directions including recommended coverage.
- C. Omit shop prime coat from surfaces subject to field welding or to be embedded in concrete.
- D. Omit shop prime coat from galvanized surfaces and stainless steel.
- E. Leave unpainted steel clean and free from rust.

PART 3 EXECUTION

3.01 ERECTION

- A. Anchor ladders and miscellaneous items securely to structural steel framing or concrete.
- B. Install expansion anchors in accordance with manufacturer's recommendations.

3.02 FIELD PAINTING

- A. Apply one field coat of primer to cleaned surfaces of bolts, new welds and abrasions to shop coat after erection.
- B. Do not paint aluminum, stainless steel, or galvanized steel work.
- C. Field finish painting:
 - 1. Prepare surfaces to be finished in conformance to recommendations of finish manufacturer.
 - 2. Finish Coat: Apply one coat of "66 Hi-Build Epoxoline", by Tnemec Co., Inc. or equal. Apply in accordance with manufacturer's directions including recommended coverage.
 - 3. Color for use on pipe supports in tunnel: BJ45-Light Gray by Tnemec Co.

3.03 TOUCH-UP OF GALVANIZED FINISH

- A. Apply one field coat of cold-applied galvanizing compound to new welds, field drilled holes, and abrasions to galvanized shop coat after erection. Prepare surfaces and apply finish in accordance with manufacturer's directions including recommended coverage.

END OF SECTION