



STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

February 17, 2010

RICHFIELD JUDGES COVERED PARKING ADMINISTRATIVE OFFICE OF THE COURTS RICHFIELD, UTAH

DFCM Project Number 09121150

Campbell & Associates
St. George, Utah
435-628-5969

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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:

RICHFIELD COVERED PARKING
ADMINISTRATIVE OFFICE OF THE COURTS – RICHFIELD, UTAH
DFCM PROJECT NO: 09121150

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 \$ 226,225.00.

A **mandatory** pre-bid meeting will be held at **1:00 P.M. on February 25, 2010** at Sevier County - Richfield Sixth District Courts 895 E. 300 N. Richfield, Utah. 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 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

Construct a covered parking structure for judges parking.
Consisting of Metal beams, columns and decking. Two car canopy and one covered entrance canopy. Includes undercover canopy lighting

Re-paving and shaping of existing parking area which includes asphalt, some curbs and exterior slabs.

**PROJECT SCHEDULE****PROJECT NAME: Richfield Covered Parking – Administrative Office of the Courts – Richfield, Utah****DFCM PROJECT NO. 09121150**

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	Thursday	February 25, 2010	1:00 PM	Richfield Courts 985 E 300 N. Richfield, 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	2:00 PM	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Thursday	March 11, 2010	2:00 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Wednesday	June 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 Richfield Covered Parking - Administrative Office of the Courts - Richfield, Utah - DFCM Project No. 09121150 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 North Pedestrian Canopy

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATE #2 West Pedestrian Canopy

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by June 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 _____

BID FORM

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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
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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 #

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
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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: _____ (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: _____ (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



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:

PROJECT MANUAL

RICHFIELD COURTS JUDGES PARKING RICHFIELD, UTAH

DFCM # 09121150

SET #

DATE: 09/14/2009

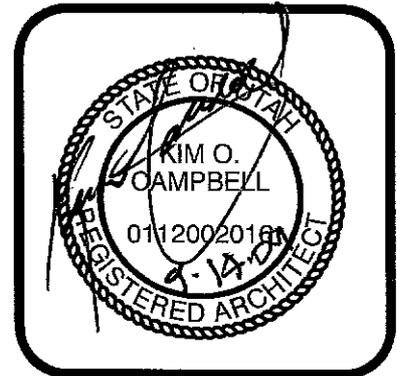
JOB: 09009

BY: K. CAMPBELL

REVISIONS:

△ _____ △ _____

△ _____ △ _____



CAMPBELL & ASSOCIATES LLC

A R C H I T E C T S
750 WEST RIDGEVIEW DRIVE ST. GEORGE, UTAH 84770
PHONE (435)628-5969 FAX (435)628-5976 E-MAIL, camarch@infowest.com

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ARCHITECTS L.L.C
ST. GEORGE P.C.

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SECTION 03 1113**STRUCTURAL CAST-IN-PLACE CONCRETE FORMING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Design, construction, and safety of formwork.
 - 2. Furnish and install required formwork ready for placing of concrete.
 - 3. Strip and dispose of formwork.
- B. Related Requirements:
 - 1. Section 03 3111: Tolerances for placing normal weight structural concrete.
- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM D 1751-04, 'Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).'

PART 2 - PRODUCTS**2.1 COMPONENTS**

- A. Forms: Wood, metal, or plastic as arranged by Contractor. Forming material shall be compatible with specified form release agents and with finish requirements for concrete to be left exposed or to receive decorative finish.

2.2 ACCESSORY PRODUCTS

- A. Form Release Agents:
 - 1. Unexposed Surfaces Only: Contractor's option.
- B. Form Release / Finish Agent
 - 1. Vertical, Exposed Surfaces or Unexposed Surfaces:
 - a. Chemically acting type.
 - b. Type Two Acceptable Products.
 - 1) Crete-Lease 727 or 20-VOC by Cresset Chemical Co, Weston, OH www.cresset.com.
 - 2) Clean Strip (J-1 or J-3 VOC) by Dayton Superior Specialty Chemicals, Kansas City, KS www.daytonsuperiorchemical.com.
 - 3) E-Z Strip or DEBOND Form Coating by L & M Construction Chemicals, Omaha, NE www.lmcc.com.
 - 4) Q-2 by Unitex, Kansas City, MO www.unitex-chemicals.com.
 - 5) U S Spec SlickKote by U S Mix Products Co www.usspec.com.
 - 6) Duogard or Duogard II by W R Meadows, Elgin, IL www.wrmeadows.com.
 - 7) Equal as approved by Architect before use.
- C. Expansion / Contraction Joints:
 - 1. **1/2 inch** thick.
 - 2. Manufactured commercial fiber type:
 - a. Meet requirements of ASTM D 1751.
 - b. Type Two Acceptable Products:
 - 1) Conflex by Knight-Celotex, Northfield, IL www.aknightcompany.com.

- 2) Sealtight by W R Meadows Inc, Hampshire, IL www.wrmeadows.com.
- 3) Equal as approved by Architect before installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Forms:
 1. Assemble forms so forms are sufficiently tight to prevent leakage.
 2. Properly brace and tie forms.
 3. Make proper form adjustments before, during, and after concreting.
 4. Use new forms, or used forms that have been cleaned of loose concrete and other debris from previous concreting and repaired to proper condition. Provide smooth liner on forms used for concrete to be exposed if necessary to attain specified finish quality.
 5. Use metal cold joint forms when unable to place concrete for footings, foundations, and slabs in continuous pours.
- B. Accessories:
 1. General:
 - a. Provide for installation of inserts, templates, fastening devices, and other accessories to be set in concrete before placing.
 - b. Position anchor bolts for hold-down anchors and columns and securely tie in place before placing concrete.
 2. Form Release / Finish Agents:
 - a. Film thickness shall be no thicker than as recommended by Manufacturer to attain specified finish. Finish on vertical, exposed concrete shall be of quality equal to CCS-1 or CCS-2 surface as defined by Cresset Chemical.
 - b. Allow no release agent on reinforcing steel or footings.
 3. Expansion Joints: Install at joints between floor slab and wall.
- C. Form Removal: Removal of forms can usually be accomplished in 12 to 24 hours. If temperature is below **50 deg F** or if concrete (stairs, beams, etc) depends on forms for structural support, leave forms intact for sufficient period for concrete to reach adequate strength.

END OF SECTION

SECTION 03 1511
ANCHORS AND INSERTS

PART 1 - GENERAL**1.1 SUMMARY**

- A. Products Furnished But Not Installed Under This Section:
 - 1. Cast-in anchors for concrete.
- B. Related Requirements:
 - 1. Section 03 3111: Installation of cast-in-place anchors and inserts.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM A 108-03, 'Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished.'
 - b. ASTM A 307-04, 'Standard Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength.'
 - c. ASTM A 496-05, 'Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.'
 - d. ASTM A 563-04a, 'Standard Specification for Carbon and Alloy Steel Nuts.'
 - e. ASTM F 1554-04, 'Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.'

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data: Manufacturer's product literature for each item.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Manufactured Units:
 - 1. General:
 - a. Use hot-dipped galvanized or stainless steel with matching nuts and washers in exterior and moist interior applications unless indicated otherwise on Drawings.
 - b. Nut: Conform to requirements of ASTM A 563, Grade A, Hex.
 - 2. Threaded rod for adhesive anchors and cast-in anchors: Conform to requirements of ASTM A 307, Grade A or ASTM F 1554.
 - 3. Anchor Bolts:
 - a. J-Bolts: Non-headed type threaded **2 inches 50 mm** minimum conforming to requirements of ASTM A 307, Grade A. Anchor hook to project **2 inches 50 mm** minimum including bolt diameter.
 - b. Headed Bolts: Headed type threaded **2 inches 50 mm** minimum conforming to requirements of ASTM A 307, Grade A.

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 03 2100
REINFORCING STEEL

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
1. Furnish and install concrete reinforcing steel as described in Contract Documents.

1.2 REFERENCES

- A. Reference Standards:
1. American Concrete Institute:
 - a. ACI 318-83.
 2. ASTM International:
 - a. ASTM A 615-05a, 'Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.'

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver bars separated by size and tagged with manufacturer's heat or test identification number.
- B. Reinforcing steel shall be free of heavy rust scales and flakes, or other coating at time of delivery and placing. Properly protect rebar on site after delivery.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Reinforcing Steel:
1. Reinforcing bars shall have grade identification marks and conform to ASTM A 615.
 - a. Grade 60 minimum, except dowels that are to be field bent, Grade 40.
 - b. Bars shall be deformed type.
 - c. Bars shall be free of heavy rust scales and flakes, or other bond*reducing coatings.

2.2 ACCESSORY PRODUCTS

- A. Bar Supports:
1. Type Two Acceptable Products:
 - a. Concrete 'dobies' or blocks wired to reinforcing.
 - b. Manufactured chairs with 4 sq in bearing surface with sub-grade, or other feature to prevent chair from being pushed into sub-grade.
 - c. Equals as approved by Architect before installation.

2.3 FABRICATION

- A. Fabricate reinforcing steel according to 'ACI Detailing Manual,' 2004 edition, and details on Drawings.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Site Tolerances:
1. Provide following minimum concrete cover for reinforcement (ACI 318-05):
 - a. Concrete cast against and permanently exposed to earth:
 - 1) Exterior Slabs on Grade (where shown): 2 inches 50 mm.
 - 2) Sections other than Slabs: 3 inches 75 mm.
 - b. Concrete Exposed to Earth or Weather:
 - 1) No. 6 and Larger Bars: 2 inches 50 mm.
 - 2) No. 5 and Smaller Bars, W31 and D31 Wire: 1-1/2 inches 38 mm.
- B. Bend bars cold.
- C. Accurately place and support with chairs, bar supports, spacers, or hangers as recommended by 'ACI Detailing Manual,' 2004 edition, except slab on grade work. Support bars in slabs on grade and footings with specified bar supports around perimeter and at 4-1/2 feet 1350 mm on center each way maximum to maintain specified concrete cover. Install bar supports at bar intersections.
- D. Dowel vertical reinforcement for formed concrete columns or walls out of footing or structure below with rebar of same size and spacing required above.
- E. Securely anchor and tie reinforcing bars and dowels before placing concrete. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Avoid splices of reinforcing bars at points of maximum stress. Lap bars 40 bar diameters minimum unless dimensioned otherwise on Drawings. Run steel reinforcing bars continuous through cold joints.

END OF SECTION

SECTION 03 3053**MISCELLANEOUS EXTERIOR CAST-IN-PLACE CONCRETE****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Compact sub-base for miscellaneous cast-in-place concrete.
 - 2. Furnish and install 4" granular base for miscellaneous cast-in-place concrete and equipment pads as described in Contract Documents.
 - 3. Furnish and install miscellaneous cast-in-place concrete.
 - 4. Furnish and install curing compounds.
- B. Related Requirements:
 - 1. Section 07 9213: Quality of Sealants.
 - 2. Section 31 2323: Compaction procedures and tolerances.
 - 3. Section 32 8423: Sleeves for underground irrigation system.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 - 1. Participate in pre-installation conference specified in Section 31 2213.
 - 2. Schedule concrete site element pre-installation conference after installation of sleeves, placing of base, and installation of forms, but before placing of concrete.

1.3 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM D 1751-04, 'Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).'

1.4 QUALITY ASSURANCE

- A. Meet quality assurance requirements specified in Section 03 3111.

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Materials:
 - 1. Concrete: Meet requirements specified in Section 03 3111 for exterior concrete.

2.2 ACCESSORY PRODUCTS

- A. Formwork: Meet requirements specified in Section 03 1113.
- B. Granular Base:

1. Road Base type gravel or crushed rock, graded by weight as follows:

Sieve	Percent Passing	Sieve	Percent Passing
One Inch	100	25 mm	100
3/4 Inch	85 - 100	19 mm	85 - 100
No. 4	45 - 60	5 mm	45 - 60
No. 10	30 - 50	1.2 mm	30 - 50
No. 200	5 - 10 (non-plastic)	0.063 mm	5 - 10 (non-plastic)

C. Expansion Joints:

1. 1/2 inch 13 mm thick.
2. Manufactured commercial fiber type:
 - a. Meet requirements of ASTM D 1751.
 - b. Type Two Acceptable Products:
 - 1) Conflex by Knight-Celotex, Northfield, IL www.aknightcompany.com.
 - 2) Sealtight by W R Meadows Inc, Hampshire, IL www.wrmeadows.com.
 - 3) Equal as approved by Architect before installation.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Sub-Base: Compact sub-base as specified in Section 31 2213.

3.2 INSTALLATION

A. General:

1. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any degree into landscaped areas.

- B. Granular Base: Place 4 inches 100 mm minimum of granular base, level, and compact as specified in Section 31 2213.

C. Sidewalks, Exterior Slabs:

1. Slope sidewalks with cross slope in direction of intended drainage.
2. Slope sidewalks away from building.
3. Do not dust with cement.

D. Joints:

1. Align joints of sidewalk and curb and gutter.
2. Expansion And Contraction Joints:
 - a. Install so top of expansion joint material is 1/4 inch 6 mm below finished surface of concrete.
 - b. No expansion joint required between curbs and walks parallel to curb.
 - c. Provide expansion joint at end of walks perpendicular to and terminating at curb or other concrete elements.
3. Scored Control Joints:
 - a. Depth of control joints shall be approximately one quarter of concrete slab thickness, but not less than one inch 25 mm.

E. Finish:

1. Flatwork:
 - a. Curb, Gutter, Sidewalks, And Miscellaneous:
 - 1) Broom finish.
 - 2) Round edges including edges formed by expansion joints.
 - 3) Remove edger marks.

- F. Membrane Curing Compound: Apply product specified in Section 03 3923 to curbs, gutters, sidewalks, flat drainage structures, stairs, landings, and pads.

3.3 FIELD QUALITY CONTROL

- A. Inspection: To allow Architect's verification of grades and elevations, notify Architect three days minimum before placing concrete for specified concrete site elements.

END OF SECTION

SECTION 03 3111**NORMAL WEIGHT STRUCTURAL CONCRETE****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install Project concrete work as described in Contract Documents.
 - 2. Quality of concrete used on Project but furnished under other Sections.
- B. Products Installed But Not Furnished Under This Section:
 - 1. Inserts, bolts, boxes, templates, and fastening devices for other work, including those for bases only for Mechanical and Electrical.
 - 2. Concrete accessories.
- C. Related Requirements:
 - 1. Divisions 22, 23, And 26: Mechanical and electrical devices including boxes, conduits, pipes, hangers, inserts, and other work to be embedded in concrete work before placing.
 - 2. Furnishing of items to be embedded in concrete specified in Section involved.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM C 33-03, 'Standard Specification for Concrete Aggregates.'
 - b. ASTM C 94-05, 'Standard Specification for Ready-Mixed Concrete.'
 - c. ASTM C 150-05, 'Standard Specification for Portland Cement.'
 - d. ASTM C 260-01, 'Standard Specification for Air-Entraining Admixtures for Concrete.'
 - e. ASTM C 494-05a, 'Standard Specification for Chemical Admixtures for Concrete.'
 - f. ASTM C 618-05, 'Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.'
 - g. ASTM E 1155-96 (2001), 'Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers.'

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Schedule pre-installation conference after placing of footings, installation of foundation forms and reinforcing steel, and installation of anchors, dowels, inserts, and block outs in foundation walls and slabs, but before placing of concrete.

1.4 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings: Show dimensioned locations of anchor bolts for hold-down anchors and columns.
- B. Informational Submittals:
 - 1. Certificates:

- a. Require mix plant to furnish delivery ticket for each batch of concrete. Keep delivery tickets at job-site for use of Owner or his representatives. Tickets shall show following:
 - 1) Name of ready-mix batch plant.
 - 2) Serial number of ticket.
 - 3) Date and truck number.
 - 4) Name of Contractor.
 - 5) Name and location of Project.
 - 6) Specific class or designation of concrete conforming to that used in Contract Documents.
 - 7) Amount of concrete.
 - 8) Time loaded.
 - 9) Type, name, manufacturer, and amount of admixtures used.
 - 10) Amount and type of cement.
 - 11) Total water content.
 - 12) Sizes and weights of sand and aggregate.
2. Design Data:
 - a. Submit mix designs to meet following requirements:
 - 1) Proportions:
 - a) Mix Type 1:
 - (1) Minimum weight cement per cu yd concrete: 517 lbs 235 kg.
 - (2) Water / Cement Ratio: 0.50 maximum by weight.
 - b) Mix Type 2:
 - (1) Minimum weight cement per cu yd concrete: 564 lbs 256 kg.
 - (2) Water / Cement Ratio: 0.45 maximum by weight.
 - c) Air Entrainment:
 - d) Exterior Concrete: 6 percent, plus or minus 1-1/2 percent.
 - e) Do not add water any time during mixing cycle above amount required to meet specified water / cement ratio. No reduction in the amount of cementitious material is allowed.
 - 2) Slump:
 - a) 4 inch 100 mm slump maximum before addition of high range water reducer.
 - b) 8 inch 200 mm slump maximum with use of high range water reducer.
 - 3) Admixtures:
 - a) Mix design shall show proposed admixture, amount, usage instructions, and justification for proposed use. Do not use any admixture without Architect's written approval.
 - b) Mineral: An amount of specified fly ash not to exceed 20 percent of weight of cement may be substituted for cement. If substituted, consider fly ash with cement in determining amount of water necessary to provide specified water / cement ratio.
 - c) Chemical: Specified accelerator or retarder may be used if necessary to meet environmental conditions.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:

1. Manufacturer List:

- a. BASF Admixtures, Cleveland, OH www.basf-admixtures.com.
- b. Bonsal American, Charlotte, NC www.bonsal.com.
- c. Dayton Superior Specialty Chemicals, Kansas City, KS www.daytonsuperiorchemical.com.
- d. Euclid Chemical Company, Cleveland, OH www.euclidchemical.com.
- e. Fritz-Pak Concrete Admixtures, Dallas, TX www.fritzpak.com.
- f. Grace Construction Products, Cambridge, MA www.graceconstruction.com.
- g. L & M Construction Chemicals, Omaha, NE www.lmcc.com.
- h. Larsen Weldcrete by Larsen Products Corp, Rockville, MD www.larsenproducts.com.
- i. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com.

- j. Sonneborn / BASF Building Systems, Shakopee, MN www.chemrex.com.
- k. TAMMS Industries, Mentor, OH www.tamms.com.
- l. Unitex, Kansas City, MO www.unitex-chemicals.com.
- m. U S Mix Products Co, Denver, CO www.usspec.com.
- n. W R Meadows, Hampshire, IL www.wrmeadows.com.

B. Performance:

- 1. Design Criteria: Conform to requirements of ASTM C 94 unless specified otherwise.
- 2. Capacities:
 - a. For testing purposes, following concrete strengths are required:
 - 1) At 7 days: 60 percent minimum of 28 day strengths.

C. Materials:

- 1. Portland Cement: Meet requirements of ASTM C 150, Type 5.
- 2. Aggregates:
 - a. Coarse:
 - 1) Meet requirements of ASTM C 33 or nonconforming aggregate that by test or actual service produces concrete of required strength and conforms to local governing codes.
 - 2) Aggregate shall be uniformly graded by weight as follows:

a) Flat Work, Size No. 67.

Sieve	Percent Passing	Sieve	Percent Passing
One Inch	100	25 mm	100
3/4 Inch	90 - 100	19 mm	90 - 100
3/8 Inch	20 - 55	9 mm	20 - 55
No. 4	0 - 10	4.75 mm	0 - 10
No. 8	0 - 5	2.36 mm	0 - 5

b) All Other, Size No. 57.

Sieve	Percent Passing	Sieve	Percent Passing
1-1/2 Inch	100	38 mm	100
One Inch	95 - 100	25 mm	95 - 100
1/2 Inch	25 - 60	12 mm	25 - 60
No. 4	0 - 10	4.75 mm	0 - 10
No. 8	0 - 5	2.36 mm	0 - 5

b. Fine:

- 1) Meet requirements of ASTM C 33.
- 2) Aggregate shall be uniformly graded by weight as follows:

Sieve	Percent Passing	Sieve	Percent Passing
3/8 Inch	100	9 mm	100
No. 4	95 - 100	4.75 mm	95 - 100
No. 8	80 - 100	2.36 mm	80 - 100
No. 16	50 - 85	1.18 mm	50 - 85
No. 30	25 - 60	0.60 mm	25 - 60
No. 50	10 - 30	0.30 mm	10 - 30
No. 100	2 - 10	0.15 mm	2 - 10

3. Water: Clear, apparently clean, and potable.

4. Admixtures And Miscellaneous:

a. Mineral:

- 1) Fly Ash Pozzolan: Meet requirements of ASTM C 618, Class F or C and with loss on ignition (LOI) of 3 percent maximum.

b. Chemical:

- 1) No admixture shall contain calcium chloride nor shall calcium chloride be used as an admixture. All chemical admixtures used shall be from same manufacturer and compatible with each other.
- 2) Air Entraining Admixture:
 - a) Meet requirements of ASTM C 260.
 - b) Type Two Acceptable Products:
 - c) MB-VR, MB-AE or Micro Air by BASF.
 - d) Air Mix 200 or AEA-92 by Euclid.
 - e) Air plus or Super Air Plus by Fritz-Pak.

- f) Sika Air by Sika.
- g) Daravair or Darex II AEA by W R Grace.
- h) Equal as approved by Architect before use.
- 3) Water Reducing Admixture:
 - a) Meet requirements of C 494, Type A and containing not more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - c) Pozzoloth Series by BASF.
 - d) Eucon WR 75 or Eucon 91 by Euclid.
 - e) FR-2 or FR-3 by Fritz-Pak.
 - f) Plastocrete 160 by Sika.
 - g) Daracem 50/55, WRDA-64, or WRDA-82 by W R Grace.
 - h) Equal as approved by Architect before use.
- 4) Water Reducing, Retarding Admixture:
 - a) Meet requirements of ASTM C 494, Type D and contain not more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - c) Pozzoloth Series by BASF.
 - d) Eucon Retarder 75 by Euclid.
 - e) FR-1 or Modified FR-1 by Fritz-Pak.
 - f) Plastiment by Sika.
 - g) Daratard-17 or Daratard-40 by W R Grace.
 - h) Equal as approved by Architect before use.
- 5) High Range Water Reducing Admixture (Superplasticizer):
 - a) Meet requirements of ASTM C 494, Type F or G and containing not more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - c) Rheobuild 1000 or Glenium Series by BASF.
 - d) Eucon 37 or Eucon 537 by Euclid.
 - e) Supercizer 1 through 7 by Fritz-Pak.
 - f) Sikament 300 by Sika.
 - g) Darachem-100 or WRDA-19 by W R Grace.
 - h) Equal as approved by Architect before use.
- 6) Non-Chloride, Non-Corrosive Accelerating Admixture:
 - a) Meet requirements of ASTM C 494, Type C or E and containing not more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - c) Accelguard 80 by Euclid.
 - d) Pozzoloth NC 534 or 122HE or Pozzutec 20+
 - e) Daraset or Polarset by W R Grace.
 - f) Equal as approved by Architect before use.

2.2 ACCESSORY PRODUCTS

A. Evaporation Retardant:

- 1. Type Two Acceptable Products:
 - a. Confilm by BASF.
 - b. Sure Film J-74 by Dayton Superior.
 - c. Euco-Bar By Euclid Chemical Co.
 - d. E-Con by L & M Construction Chemicals.
 - e. Pro Film by Unitex.
 - f. U S Spec Monofilm ER by U S Mix Products.
 - g. Equal as approved by Architect before use.

B. Bonding Agents:

- 1. Type Two Acceptable Products:
 - a. Acrylic Additive by Bonsal American.
 - b. Day Chem Ad Bond (J-40) by Dayton Superior.
 - c. Flex-Con by Euclid Chemical Co.

- d. Larsen Weldcrete by Larsen Products Corp.
- e. Everbond by L & M Construction Chemicals.
- f. Acryl Set by BASF.
- g. Sonocrete by Sonneborn.
- h. Tamms Bond by TAMMS Industries.
- i. U S Spec Multicoat by U S Mix Products.
- j. Intralok by W R Meadows.
- k. Equal as approved by Architect before use.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Inserts, bolts, boxes, templates, pipes, conduits, and other accessories required by Divisions 22, 23, and 26 shall be installed and inspected before placing concrete.
- B. Install inserts, bolts, boxes, templates, pipes, conduits, and other accessories furnished under other Sections to be installed as part of work of this Section. Tie anchor bolts for hold-down anchors and columns securely to reinforcing steel.
- C. Remove water and debris from space to be placed.

3.2 INSTALLATION

- A. Special Techniques:
 - 1. Cold Weather Concreting Procedures:
 - a. General Requirements:
 - 1) Materials and equipment required for heating and protection of concrete shall be approved and available at Project site before beginning cold weather concreting.
 - 2) Forms, reinforcement, metallic embedments, and fillers shall be free from snow, ice, and frost. Surfaces that will be in contact with newly placed concrete, including sub-grade materials, shall be **35 deg F 2 deg C** minimum at time of concrete placement.
 - 3) Thaw sub-grade **6 inches 150 mm** deep minimum before beginning concrete placement. If necessary, re-compact thawed material.
 - 4) Use no frozen materials or materials containing ice.
 - b. Requirements When Average 24 Hour Temperature, midnight to midnight, Is Below **40 deg F 4 deg C**:
 - 1) Temperature of concrete as placed and maintained shall be **55 deg F 13 deg C** minimum and **75 deg F 27 deg C** maximum.
 - 2) Heat concrete for 72 hours minimum after placing if regular cement is used; for 48 hours if high early strength cement is used; or longer if determined necessary by Architect. During this period, maintain concrete surface temperature between **55 and 75 deg F 13 and 27 deg C**.
 - 3) Vent flue gases from combustion heating units to outside of enclosure to prevent carbonation of the concrete surface.
 - 4) Prevent concrete from drying during heating period. Maintain housing, insulation, covering, and other protection 24 hours after heat is discontinued.
 - 5) After heating period, if temperature falls below **32 deg F 0 deg C**, protect concrete from freezing until strength of **2000 psi 14 MPa** minimum is achieved. Protect flatwork exposed to melting snow or rain during day and freezing during night from freezing until strength of **3500 psi 24 Mpa** minimum is achieved.
 - c. Requirements When Average 24 Hour Temperature, midnight to midnight, Is Above **40 deg F 4 deg C**, but when temperature falls below **32 deg F 0 deg C**:
 - 1) Protect concrete from freezing for 72 hours after placing, or until a strength of **2000 psi 14 Mpa** is achieved, whichever is longer. Protect flatwork exposed to melting snow or

rain during day and freezing during night from freezing until strength of 3500 psi 24 Mpa minimum is achieved.

- d. Protect soil supporting concrete footings from freezing under any circumstances.
- 2. Hot Weather Concreting Procedures:
 - a. Maximum concrete temperature allowed is 90 deg F 32 deg C in hot weather.
 - b. Cool aggregate and subgrades by sprinkling.
 - c. Avoid cement over 140 deg F 60 deg C.
 - d. Use cold mixing water or ice.
 - e. Use fog spray or evaporation retardant to lessen rapid evaporation from concrete surface.
- B. Tolerances:
 - 1. Tolerances shall conform to requirements of ACI 117, except where specified differently.
- C. Placing:
 - 1. General:
 - a. Place as soon after mixing as possible. Deposit as nearly as possible in final position. Placing of concrete shall be continuous until a panel or section is complete.
 - b. In order to avoid overloading of forms and ties, observe following rate of filling for various air temperatures:
 - 1) Table Five: Placing Rate.

Temperature	Rate of Fill per Hour	Temperature	Rate of Fill per Hour
40 deg F	2 feet	4 deg C	600 mm
50 deg F	3 feet	10 deg C	900 mm
60 deg F	4 feet	16 deg C	1 200 mm
70 deg F	5 feet	21 deg C	1 500 mm
 - c. Compact concrete in forms by vibrating and other means where required. Thoroughly work in concrete around reinforcing bars.
 - d. Do not embed aluminum in concrete.
 - e. Do not use contaminated, deteriorated, or re-tempered concrete.
 - f. Avoid accumulation of hardened concrete.
 - 2. Footings:
 - a. Bear into undisturbed earth or on mechanically compacted engineered fill. Exterior wall footing shall bear minimum frost depth below finish grades.
 - b. Level top of finish footing and leave rough.
 - c. Where joints are required, bulkhead, key horizontally, and dowel with two No. 5 reinforcing bars, 48 inches 1 200 mm long.
 - 3. Exterior Slabs:
 - a. Dusting with cement not permitted.
 - b. For continuous placing and where shown on Drawings, saw cut one inch deep control joints before shrinkage occurs.
 - 4. Joints:
 - a. Construction Joints: Locate where shown on Drawings to least impair strength of completed structure.
 - 5. Bonding Fresh And Hardened Concrete:
 - a. Re-tighten forms.
 - b. Roughen surfaces.
 - c. Clean off foreign matter and laitance.
 - d. Wet but do not saturate.
 - e. Slush with neat cement grout or apply bonding agent.
 - f. Proceed with placing new concrete.
- D. Finishing:
 - 1. Rubbed Finish, Exposed Vertical Surfaces:
 - a. Immediately after removing forms, remove joints, marks, bellies, projections, loose materials, and cut back metal ties from surfaces to be exposed.
 - b. Point up voids with cement mortar, 1:2 mix, and rub exposed surface with carborundum to smooth, even surface.
 - 2. Broom Finishes, Exterior Flatwork Not Specified in Section 03 3053:
 - a. Broom finish exterior slabs.

- b. Round edges including edges formed by expansion joints.
 - c. Remove edger marks.
- E. Curing:
- 1. Concrete Paving: Membrane cure as specified in Section 03 3923.
 - 2. All Other Concrete Flatwork And Curbs: Membrane cure as specified in Section 03 3923

3.3 FIELD QUALITY CONTROL

- A. Inspection: Notify Architect three days minimum before placing concrete for footings, and building slabs.

3.4 PROTECTION

- A. Protect concrete that has not received its initial set from precipitation to avoid excess water in mix and unsatisfactory surface finish.
- B. Do not allow materials resulting from construction activities, which will affect concrete or application of finish floor systems adversely, to come in contact with interior concrete slabs.

END OF SECTION

SECTION 03 3923**MEMBRANE CONCRETE CURING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Quality of membrane concrete curing as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 03 3053: Miscellaneous Cast-In-Place Concrete.
 - 2. Section 03 3111: Normal weight structural concrete.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM C 309-06, 'Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.'

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Exterior:
 - 1. Low VOC (less than 350 grams per liter), water-borne, membrane forming curing compound meeting requirements of ASTM C 309, Type 2.
 - 2. Horizontal Miscellaneous Cast-In-Place Concrete
 - a. Class Two Quality Standard.
 - 1) Vocomp 20 Cure and Seal by W. R. Meadows.
 - 3. Concrete Paving:
 - a. Class Two Quality Standard.
 - 1) 1200 White by W. R. Meadows.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Protection of In-Place Conditions: Protect surfaces that will be receiving products or systems incompatible with curing compounds. Where such surfaces do receive curing compound, remove to extent required by installer of products and systems to be subsequently installed and at no additional cost to Owner.

END OF SECTION

SECTION 03 6213**NON-METALLIC NON-SHRINK GROUTING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install structural grout.
 - a. For grout base for structural columns.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM C 1107-05, 'Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).'

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Commercial non-shrink grout conforming to requirements of ASTM C 1107, Type B or Type C and providing compressive strength of **6000 psi** **41MPa** minimum.
- B. Type Two Acceptable Products:
 - 1. Normal Construction Grout A by Bonsal American, Charlotte, NC www.bonsal.com.
 - 2. Advantage 1107 Grout by Dayton Superior Corporation, Oregon, IL www.daytonsuperiorchemical.com.
 - 3. NS Grout by Euclid Chemical Co, Cleveland, OH www.euclidchemical.com.
 - 4. Construction Grout by Five Star Products Inc, Fairfield, CT www.fivestarproducts.com.
 - 5. Duragrout by L&M Construction Chemicals Inc, Omaha, NE www.lmcc.com.
 - 6. Sonneborn / deGussa Building Systems, Shakopee, MN www.chemrex.com.
 - 7. Horn Grout by TAMMS Industries Inc, Kirkland IL www.tamms.com.
 - 8. U S Spec MP Grout by U S Mix Products Co, Denver, CO www.usspec.com.
 - 9. CG-86 Grout by W R Meadows, Hampshire, IL www.wrmeadows.com.
 - 10. Equal as approved by Architect before installation.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Completely eliminate air pockets and provide full contact between grout and item being grouted. Do not exceed Manufacturer's recommended thickness.

END OF SECTION

DIVISION 05: METALS

05 0000 METALS

05 0503 SHOP-APPLIED METAL COATINGS
05 0523 METAL FASTENINGS

05 1000 STRUCTURAL METAL FRAMING

05 1223 STRUCTURAL STEEL FOR BUILDINGS

END OF TABLE OF CONTENTS

SECTION 05 0503**SHOP-APPLIED METAL COATINGS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Quality of factory or shop-applied priming applied to steel supplied to Project without finish coat.
 - 2. Quality of and procedures for field touch-up and repair of factory-applied priming.
- B. Related Requirements:
 - 1. Sections under 09 9000 heading: Finish painting.

PART 2 - PRODUCTS**2.1 FINISHES**

- A. Factory And Shop-Applied Primer: Compatible with and of equal or better quality than finish paint system to be applied by Sections under 09 9000 heading. Primer on unexposed, unfinished surfaces may be fabricator's standard shop coat.
- B. Repairs To Primed Surface: Unless otherwise specified, use primer which matches characteristics of original primer and is compatible with and of equal or better quality than finish paint system to be applied by Sections under 09 9000 heading.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. General:
 - 1. Clean, grind, or otherwise prepare welds in steel that is to be coated within limits acceptable to welder responsible for structural integrity.
 - 2. Surfaces to be coated shall be clean, dry and free of oil, grease, and corrosion products.
- B. Preparation Of Primed, Ungalvanized Surfaces: Clean welds and grind serious abrasions.

3.2 REPAIR / RESTORATION

- A. Repairs To Primed, Ungalvanized Surfaces:
 - 1. Thoroughly clean metal and give one prime coat of specified material, well-worked into metal joints and open spaces. Match existing primed finish as required.
 - a. Do not apply primer at temperatures below 45 deg F 7 deg C.
 - b. Protect un-primed machine-finished surfaces against corrosion by priming.
 - 2. All Items:
 - a. Apply repair materials immediately after surface preparation is complete.
 - b. Take thickness measurements, with either magnetic or electromagnetic gauge, to ensure applied coating is as specified or agreed to.

END OF SECTION

SECTION 05 0523
METAL FASTENING

PART 1 - GENERAL**1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Quality of structural metal-to-metal, wood-to-metal, and wood-to-wood bolts used on Project.
 - 2. Requirements and standards for site welded metal-to-metal connections.
- B. Related Requirements:
 - 1. Furnishing and installing of structural bolts specified under Section concerned.
 - 2. Performance of welding specified under Section concerned.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM A 36-05, 'Standard Specification for Carbon Structural Steel.'
 - b. ASTM A 307-04, 'Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.'
 - c. ASTM A 325-02, 'Standard Specification for High-Strength Bolts for Structural Steel Joints.'
 - 2. American Welding Society / American National Standards Institute:
 - a. AWS / ANSI D1.1-2003, 'Structural Welding Code - Steel.'
 - b. AWS / ANSI D1.3-1998, 'Structural Welding Code - Sheet Steel.'

1.3 QUALITY ASSURANCE

- A. Qualifications: Welders shall be certified 30 days minimum before beginning work on Project. If there is doubt as to proficiency of welder, Architect may require welder to take another test, at no expense to Owner. Certification shall be by Pittsburgh Laboratories or other authority approved by Architect.
- B. Certifications: Maintain welder's certifications on job-site.

PART 2 - PRODUCTS**2.1 MANUFACTURED UNITS**

- A. Materials:
 - 1. Bolts And Threaded Fasteners:
 - a. Bolts: Conform to requirements of ASTM A 307, Grade A.

2.2 ACCESSORY PRODUCTS

- A. Arc-Welding Electrodes: Type E70XX AWS Iron and Steel Arc-welding electrodes and meeting current AISC Specifications.

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Welding shall meet requirements of ANSI / AWS D1.1 and D1.3.

END OF SECTION

SECTION 05 1223**STRUCTURAL STEEL FOR BUILDINGS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Products Furnished But Not Installed Under This Section:
 - 1. Structural steel for canopy.
- B. Related Requirements:
 - 1. Section 05 0503: Quality of priming.
 - 2. Section 05 0523: Quality of welding.

1.2 REFERENCES

- A. Reference Standards:
 - 1. American Society For Testing And Materials:
 - a. ASTM A 36-05, 'Standard Specification for Carbon Structural Steel.'
 - b. ASTM A 53-05, 'Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.'
 - c. ASTM A 500-03a, 'Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.'

PART 2 - PRODUCTS**2.1 COMPONENTS**

- A. Materials:
 - 1. Structural Unit Connections, Channel Frames, And Miscellaneous Structural Steel: Meet requirements of ASTM A 36.
- B. Fabrication:
 - 1. Shop prime steel provided under this Section.
- C. Finishes:
 - 1. Shop Primer:
 - a. Concealed Steel: Fabricator's standard shop coat.
 - b. Exposed Steel To Receive Finish: Primer shall be acceptable to Finish Manufacturer.

PART 3 - EXECUTION: Not Used**END OF SECTION**

DIVISION 07: THERMAL AND MOISTURE PROTECTION

07 4000 ROOFING AND SIDING PANELS

07 4619 STEEL DECKING

07 9000 JOINT PROTECTION

07 9213 ELASTOMERIC JOINT SEALANTS

END OF TABLE OF CONTENTS

SECTION 07 4619**STEEL DECKING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install steel decking as described in Contract Documents.

1.2 REFERENCES**PART 2 - PRODUCTS****2.1 SYSTEMS**

- A. Manufacturers:
 - 1. Open
- B. Materials:
 - 1. 26GA MBCI PBR Panel
- C. Finish:
 - 1. Shop prime – field painted.

2.2 ACCESSORY PRODUCTS

- A. Fasteners: See structural.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Isolate dissimilar metals to prevent electrolytic action.
- B. Paint exposed fasteners to match canopy.

END OF SECTION

SECTION 07 9213**ELASTOMERIC JOINT SEALANTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install sealants not specified to be furnished and installed under other Sections.
 - 2. Quality of sealants to be used on Project not specified elsewhere, including submittal, material, and installation requirements.
- B. Related Requirements:
 - 1. Furnishing and installing of sealants is specified in Sections specifying work to receive new sealants.

1.2 DELIVERY, STORAGE, AND HANDLING

- A. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
- B. Deliver and keep in original containers until ready for use.
- C. Store in a cool place, but never under 40 deg F 4 deg C.

PART 2 - PRODUCTS**2.1 SYSTEMS**

- A. Manufacturers:
 - 1. Manufacturer Contact List:
 - a. Dow Corning Corp, Midland, MI www.dowcorning.com.
 - b. GE Sealants & Adhesives, Huntersville, NC www.gesealants.com.
 - c. Laticrete International Inc, Bethany, CT www.laticrete.com.
 - d. Sherwin-Williams, Cleveland, OH www.sherwin-williams.com.
 - e. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com.
 - f. Tremco, Cleveland, OH www.tremcosealants.com.
- B. Materials:
 - 1. Sealants provided shall meet Manufacturer's shelf-life requirements.
 - 2. Sealants At Exterior Building Elements:
 - a. Joints around conduits.
 - b. Other joints necessary to seal off building from outside air and moisture.
 - c. Approved Products
 - 1) Dow Corning:
 - a) Primer: 1200.
 - b) Sealant: 791.
 - 2) GE Sealants & Adhesives:
 - a) Primer: SS4044.
 - b) Sealant: Silpruf SCS 2000.
 - 3) Tremco:
 - a) Primer:
 - (1) Metal: No. 20.
 - (2) Other: No. 23.

- b) Sealant: Spectrum 1.
- 3. Sealants At Exterior Concrete:
 - a. Approved Products.
 - 1) Joints between building foundations and exterior site concrete:
 - a) Dow Corning:
 - (1) Primer: 1200.
 - (2) Sealant: 790.
 - b) GE Sealants & Adhesives:
 - (1) Primer: SS4044.
 - (2) Sealant: Silpruf SCS 2000.
 - 2) Expansion joints in Portland cement concrete driveways and parking lots:
 - a) Dow Corning: 888 (NS). 890 (SL) may be used on non-sloping areas.
- 4. Color: As selected by Architect from Manufacturer's standard colors.

2.2 ACCESSORY PRODUCTS

- A. Backing: Flexible closed cell, non-gassing polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surfaces shall be clean, dry, and free of dust, oil, grease, dew, or frost.
- B. Apply primer, if required.
- C. Joint Backing:
 - 1. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than **3/8 inch 10 mm** deep.
 - 2. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.

3.2 APPLICATION

- A. Do not use damaged or deteriorated materials.
- B. Apply sealant with hand-calking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
- C. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction, i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
- D. Depth of sealant bite shall be **1/4 inch 6 mm** minimum and **1/2 inch 13 mm** maximum, but never more than one half or less than one fourth joint width.
- E. Do not apply calking at temperatures below **40 deg F 4 deg C**.
- F. Calk gaps between painted or coated substrates and unfinished or pre-finished substrates. Calk gaps larger than **3/16 inch 9 mm** between painted or coated substrates.

3.3 CLEANING

- A. Clean adjacent materials, which have been soiled, immediately (before setting) as recommended by Manufacturer.

END OF SECTION

DIVISION 09: FINISHES

09 9000 PAINTS AND COATINGS

- 09 9001 COMMON PAINTING AND COATING REQUIREMENTS
- 09 9112 EXTERIOR PAINTED FERROUS METAL

END OF TABLE OF CONTENTS

SECTION 09 9001

COMMON PAINTING AND COATING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Common procedures and requirements for field-applied painting and coating.
- B. Related Requirements:
 - 1. Section 05 0503: Quality of shop priming of steel and iron.
 - 2. Section 32 1723: Pavement Marking.

1.2 REFERENCES

- A. Reference Standards:
 - 1. Master Painters Institute:
 - a. MPI(a), Mar 2001, 'Architectural Painting Specification Manual.'
- B. Definitions:

- 1. Gloss Levels:
 - a. Specified paint gloss level shall be defined as sheen rating of applied paint, in accordance with following terms and values, unless specified otherwise for a specific paint system.

Gloss Level '1'	Traditional matte finish - flat	0 to 5 units at 60 degrees to 10 units maximum at 85 degrees.
Gloss Level '2'	High side sheen flat - 'velvet-like' finish	10 units maximum at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '3'	Traditional 'eggshell-like' finish	10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '4'	'Satin-like' finish	20 to 35 units at 60 degrees and 35 units minimum at 85 degrees.
Gloss Level '5'	Traditional semi-gloss	35 to 70 units at 60 degrees.
Gloss Level '6'	Traditional gloss	70 to 85 units at 60 degrees.
Gloss Level '7'	High gloss	More than 85 units at 60 degrees.

- 2. Properly Painted Surface: Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet minimum under normal lighting conditions and from normal viewing position (MPI(a), PDCA P1.92).
- 3. Damage Caused By Others: Damage caused by individuals other than those under direct control of Painting Applicator (MPI(a), PDCA P1.92).
- 4. Latent Damage: Damage or conditions beyond control of Painting Applicator caused by conditions not apparent at time of initial painting or coating work.

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Include following information for each painting system, arranged in same order as in Project Manual.

- 1) Manufacturer's cut sheet for each component of each system indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
 - 2) Copies of appropriate entries from MPI Approved Product List. Products from MPI Approved Product List is mandatory for Sections 09 9112, 09 9123 and 09 9124. If proposed manufacturer has products listed for these three Sections, but not for other Sections, Architect may approve products submitted by proposed manufacturer for other Sections.
 - 3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.
2. Samples: Provide two 4 inch by 6 inch 100 by 150 mm minimum draw-down cards for each paint or coating color selected for this Project.
- B. Informational Submittals:
1. Manufacturer Instructions: Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
- C. Closeout Submittals:
1. Operations And Maintenance Data: Include following in Operations And Maintenance Manual:
 - a. Manufacturer's cut sheet for each component of each system.
- D. Maintenance Materials Submittals:
1. Extra Stock Materials:
 - a. Provide painting materials in Manufacturer's original containers and with original labels in each color used. Label each can with color name, mixture instructions, date, and anticipated shelf life.
 - b. Provide one quart of each finish coat and one pint of each primer and of each undercoat in each color used.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
- B. Field Samples:
1. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one surface for application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.
 2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.
 3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container. Deliver amount of materials necessary to meet Project requirements in single shipment. Notify Architect two working days before delivery of coatings.
- B. Store materials in single place.
- C. Keep storage area clean and rectify any damage to area at completion of work of this Section. Maintain storage area at 55 deg F 13 deg C minimum.

1.6 FIELD CONDITIONS

- A. Ambient Conditions:
 1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product.
 2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted. Inspection of painting work shall take place under same lighting conditions as application. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92

PART 2 - PRODUCTS

2.1 SYSTEMS

- A. Performance:
 1. Design Criteria:
- B. Materials:
 1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
 2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.
- B. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.
- C. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.

3.2 PREPARATION

- A. Protection Of In-Place Conditions:
 1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
 - a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
- B. Surface Preparation:

1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
2. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
3. Do no exterior painting while surface is damp, unless recommended by Manufacturer, nor during rainy or frosty weather. Interior surfaces shall be dry before painting. Moisture content of materials to be painted shall be within tolerances acceptable to Paint Manufacturer.

3.3 APPLICATION

- A. Interface With Other Work:
 1. Coordinate with other trades for materials and systems that require painting before installation.
 2. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.
- B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents, including but not limited to following items:
 1. Paint electrical items that require field painting. These include but are not limited to:
 - a. Electrical conduits and boxes.
- C. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.
- D. Touch up suction spots after application of first finish coat.
- E. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.
- F. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.
- G. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.
- H. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

3.4 ADJUSTMENT

- A. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.5 CLEANING

- A. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
- B. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition. Remove debris caused by work of paint Sections from premises.

ATTACHMENTS

PART 4 - PAINT COLOR SCHEDULE

- A. Colors:
 - 1. Exterior:
 - a. Exterior Metal:
 - 1) Class One Color Quality Standard.

END OF SECTION

SECTION 09 9112**EXTERIOR PAINTED FERROUS METAL****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Preparing and painting new exterior canopy ungalvanized iron and steel surfaces.
- B. Related Requirements:
 - 1. Section 09 9001: Common Painting Requirements

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Manufacturers:
 - 1. Approved Products and Manufacturers.
 - a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.
- B. Description:
 - 1. Use MPI(a) EXT 5.1M Waterborne Light Industrial Coating system .
- C. Performance:
 - 1. Design Criteria:
 - a. Systems specified are in addition to prime coats provided under other Sections of Project Manual.
 - b. Finish Requirements: Use MPI Premium Grade finish requirements for work of this Section.
 - c. Gloss / Sheen Level Required: Gloss Level 5.
- D. Materials:
 - 1. Primer Coat: MPI Product 107.
 - 2. Finish Coats: MPI Product 163.

PART 3 - EXECUTION**3.1 APPLICATION**

- A. General: See appropriate paragraphs of Section 09 9001.
- B. Clean metal to be painted of rust, mill scale, grease, oil, and welding spatters, burrs, flux, slag, and fume. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying primer coat.

END OF SECTION

DIVISION 10: SPECIALTIES

10 1000 INFORMATION SPECIALTIES

10 1453 TRAFFIC SIGNAGE

END OF TABLE OF CONTENTS

SECTION 10 1453**TRAFFIC SIGNAGE****PART 1 - GENERAL****1.1 SUMMARY**

A. Includes But Not Limited To:

1. Furnishing and installing of exterior post-mounted site signage as described in Contract Documents.

PART 2 - PRODUCTS**2.1 ASSEMBLIES**

A. Permanently Mounted:

1. Post Foundation Concrete: One cu ft cement, 2 cu ft sand, 4 cu ft gravel, and 5 gallons minimum to 6 gallons maximum of water.
2. Post Setting Grout at Sleeves:
 - a. Type Two Acceptable Products:
 - 1) Normal Construction Grout A by Bonsal American, Charlotte, NC www.bonsal.com.
 - 2) Advantage 1107 Grout by Dayton Superior Specialty Chemicals, Kansas City, KS www.daytonsuperiorchemical.com.
 - 3) NS Grout by Euclid Chemical Co, Cleveland, OH www.euclidchemical.com
 - 4) 5 Star Special Grout 110 by Five Star Products Inc, Fairfield, CT www.fivestarproducts.com.
 - 5) Duragrout by L&M Construction Chemicals Inc, Omaha, NE www.lmcc.com
 - 6) Sonneborn / BASF Building Systems, Shakopee, MN www.chemrex.com.
 - 7) Tamms Grout 621 by TAMMS Industries, Mentor, OH www.tamms.com.
 - 8) U S Spec MP Grout by U S Mix Products Co www.usspec.com.
 - 9) CG-86 Grout by W R Meadows, Hampshire, IL www.wrmeadows.com.
 - 10) Equal as approved by Architect before use.
3. Accessible Parking Signs:
 - a. Sign graphics and lettering shall be minimum required by agency having jurisdiction.
 - b. Sign shall have rounded corners.
 - c. Sign shall meet current HEW and ANSI A117.1 accessibility codes.
 - d. Letters shall be Helvetica Medium with **1/4 inch 6 mm** stroke.
4. Posts:
 - a. Type Two Acceptable Products:
 - 1) Nominal **2 inch 50 mm** outside diameter by **7 feet 2 100 mm** high with wall thickness equivalent to Schedule 40 with satin-brushed natural finish for aluminum or factory two-part epoxy paint for steel.
 - 2) **2 inch 50 mm** square 14 ga Quik-Punch or Telespar by Allied Tube & Conduit, Harvey, IL www.alliedtube.com.
 - 3) Equal as approved by Architect before installation.
5. Mounting Sleeves: Nominal **2-1/4 inch 56 mm** outside diameter pipe, or **2-1/4 inch 56 mm** square 12 ga Quik-Punch, **30 inches 750 mm long**.

PART 3 - EXECUTION**3.1 INSTALLATION**

A. Permanently Mounted:

1. Locate as shown on Site Plan.
2. Install signs square and plumb.
3. Post Foundations:
 - a. Except atop retaining walls, mix concrete components thoroughly, place in post foundation holes **8 inches 200 mm** in diameter by **36 inches 900 mm** deep, and set mounting sleeves. For installation on retaining walls, cast sleeves into retaining wall. Sleeves shall extend **2 inches 50 mm** maximum above top of finish concrete elevation.
 - 1) Where posts are installed before installation of slabs, measure post foundation depth from top of slab. Extend bottom of slab footing sufficient to allow specified amount of concrete around post.
 - 2) Where posts are installed after installation of slabs, core slab **8 inches 200 mm** in diameter minimum to accommodate post foundation.
4. Install post in mounting sleeve so bottom of post is **6 inches 150 mm** from top of sleeve. Rivet post to mounting sleeve or bolt using tamper-proof bolts.

END OF SECTION

DIVISION 26: ELECTRICAL

26 0000 ELECTRICAL

- 26 0500 ELECTRICAL GENERAL PROVISIONS
- 26 0519 CONDUCTORS AND CABLES 600V AND BELOW
- 26 0529 SUPPORTING DEVICES
- 26 0532 CONDUIT RACEWAY
- 26 0533 ELECTRICAL BOXES AND FITTINGS

26 4000 LIGHTNING PROTECTION

- 26 4119 DEMOLITION

26 5000 LIGHTING

- 26 5100 INTERIOR AND EXTERIOR BUILDING LIGHTING

END OF TABLE OF CONTENTS

SECTION 260500 - ELECTRICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Architectural, Structural, Mechanical and other applicable documents are considered a part of the electrical documents insofar as they apply as if referred to in full.

1.2 DESCRIPTION OF WORK:

- A. The extent of electrical work is indicated on drawings and/or specified in Divisions 26, 27 and 28 sections of the specification. Provide all labor, materials, equipment, supervision and service necessary for a complete electrical system. Work includes, but is not necessarily limited to, the following items.

<u>ITEM</u>	<u>SECTION</u>
1. Electrical General Provisions	260500
2. Conductors and Cables	260519
3. Supporting Devices	260529
4. Conduit Raceways	260532
5. Electrical Boxes and Fittings	260533
6. Demolition	264119
7. Interior and Exterior Building Lighting	265100

- B. Use of standard industry symbols together with the special symbols, notes, and instructions indicated on the drawings describe the work, materials, apparatus and systems required as a portion of this work.
- C. Visit the site during the bidding period to determine existing conditions affecting electrical and other work. All costs arising from site conditions and/or preparation shall be included in the base bid. No additional charges will be allowed due to inadequate site inspection.

1.3 DEFINITION OF TERMS

- A. The following terms used in Divisions 26, 27 and 28 documents are defined as follows:
 - 1. "Provide": Means furnish, install and connect, unless otherwise indicated.
 - 2. "Furnish": Means purchase and deliver to project site.
 - 3. "Install": Means to physically install the items in-place.
 - 4. "Connect": Means make final electrical connections for a complete operating piece of equipment.

1.4 RELATED SECTIONS:

- A. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
- B. General and Supplementary Conditions: Drawings and general provisions of contract and Division 1 of the Specifications, apply to all Division 26, 27 and 28 sections.

C. Miscellaneous Metal Work:

1. Provide fittings, brackets, backing, supports, rods, welding and pipe as required for support and bracing of raceways, lighting fixtures, etc. See Division 5, Metals for material and installation requirements.

D. Miscellaneous Lumber and Framing Work:

1. Provide wood grounds, nailers, blocking, fasteners, and anchorage for support of electrical materials and equipment. See Division 6, Rough Carpentry for material and installation requirements.

E. Moisture Protection:

1. Provide membrane clamps, sheet metal flashing, counter flashing, caulking and sealants as required for waterproofing of conduit penetrations and sealing penetrations in or through fire walls, floors and ceiling slabs and foundation walls. All penetrations through vapor barriers at slabs on grade shall be taped and made vaportight. See Division 7, Thermal and Moisture Protection for material and installation requirements.

F. Access panels and doors:

1. Provide in walls, ceiling, and floors for access to electrical devices and equipment. See Division 8, Doors and Windows for material and installation requirements.

G. Painting:

1. Provide surface preparation, priming and finish coating as required for electrical cabinets, exposed conduit, pull and junction boxes, poles, surface metal raceways, etc. See Division 9, Finishes for material and installation requirements.

1.5 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

- A. Before bidding, Contractor shall familiarize himself with the drawings, specifications and project site. Submit requests for clarification to Architect/Engineer in writing prior to issuance of final addendum. After signing the contract, the Contractor shall meet the intent, purpose, and function of the Contract Documents. Any costs of materials, labor and equipment arising therefrom, to make each system complete and operable, is the responsibility of the Contractor.

1.6 QUALITY ASSURANCE:

- A. Reference to codes, standards, specifications and recommendations of technical societies, trade organizations and governmental agencies refers to the latest edition of such publications adopted and published prior to submittal of the bid proposed, unless noted otherwise herein. Such codes or standards are considered a part of this specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred as reducing the quality, requirements or extent of the Drawings and Specifications. Perform

work in accordance with applicable requirements of all governing codes, rules and regulations including the following minimum standards, whether statutory or not:

1. National Electric Code (NEC).
 2. International Building Code (IBC).
 3. International Fire Code (IFC).
 4. International Mechanical Code (IMC).
- C. Standards: Comply with the following standards where applicable for equipment and materials specified under this Division.
- | | | |
|----|-------|--|
| 1. | UL | Underwriters' Laboratories |
| 2. | ASTM | American Society for Testing Materials |
| 3. | CBN | Certified Ballast Manufacturers |
| 4. | IPCEA | Insulated Power Cable Engineers Association |
| 5. | NEMA | National Electrical Manufacturer's Association |
| 6. | ANSI | American National Standards Institute |
| 7. | ETL | Electrical Testing Laboratories |
- D. All electrical apparatus furnished under this Section shall conform to (NEMA) standards and the NEC and bear the Underwriters' Laboratories (UL) label where such label is applicable.
- E. Comply with requirements of State and Local Ordinances. If a conflict occurs between these requirements and the Contract Documents, the most stringent requirements shall govern. The Contractor accepts this responsibility upon submitting his bid, and no extra charge will be allowed after the contract is awarded. This shall not be construed as relieving the Contractor from complying with any requirements of the Contract Documents which may be in excess of the aforementioned requirements, and not contrary to same.
- F. Obtain all permits, inspections, etc. required by authority having jurisdiction. Include all fees in bid. Furnish a certificate of approval to the Owner's Representative from the Inspection Authority at completion of the work.
- G. Employ only qualified craftsmen with at least three years of experience. Workmanship shall be neat, have a good mechanical appearance and conform to best electrical construction practices. Provide a competent superintendent to direct the work at all times. Any person found incompetent shall be discharged from the project and replaced by satisfactory personnel.
- H. Contractor shall have a current state contracting license applicable to type of work to be performed under this contract.

1.7 SUBMITTALS:

A. SHOP DRAWINGS AND PRODUCT DATA:

1. After the Contract is awarded but prior to manufacture or installation of any equipment, prepare complete Shop Drawings and Brochures for materials and equipment as required by each section of the specification. Submit 8 complete sets for review. All sets of shop drawing material shall be bound. Prior to submission of the Shop Drawings and Project Data, review and certify that they are in compliance with the Contract Documents. Verify all dimensional

information to insure proper clearance for installation of equipment. Check all materials and equipment after arrival on the job site and verify compliance with the Contract Documents. A minimum period of two weeks, exclusive of transmittal time, will be required each time Shop Drawing and/or Brochure is submitted or resubmitted for review. This time period shall be considered by the Contractor when scheduling submittal data. If the shop drawings are rejected twice, the contractor shall reimburse the engineer the sum of \$200.00 for the third review and any additional reviews required.

2. Review of Shop Drawings and Brochures shall not relieve the Contractor of responsibility for dimensions and/or errors that may be contained therein, or deviations from the Contract Document's requirements. It shall be clearly understood that the noting of some errors but overlooking others does not grant the Contractor permission to proceed in error. Regardless of any information contained in the Shop Drawings and Brochures, the requirements of the Contract Document's shall govern and are not waived, or superseded in any way by the review of the Shop Drawings and Brochures.
3. Certifications shall be written or in the form of rubber stamp impressions as follows:
4. I hereby certify that this Shop Drawing and/or Brochure has been checked prior to submittal and that it complies in all respects with the requirements of the Contract Drawings and Specifications for this Project.

(Name of Electrical Subcontractor)

Signed _____.

Position _____ Date _____

5. Observe the following rules when submitting the Shop Drawings and Brochures.
 - a. Each Shop Drawing shall indicate in the lower right hand corner, and each Brochure shall indicate on the front cover the following: Title of the sheet or brochure, name and location of the building; names of the Architect and Electrical Engineer, Contractor, Subcontractors, Manufacturer, Supplier/Vendor, etc., date of submittal, and the date of correction and revision. Unless the above information is included the submittal will be returned for resubmittal.
 - b. Shop Drawings shall be done in an easily legible scale and shall contain sufficient plans, elevations, sections, and isometrics to clearly describe the equipment or apparatus, and its location. Drawings shall be prepared by an Engineer/Draftsman skilled in this type of work. Shop Drawings shall be drawn to at least 1/4" = 1'0" scale.
 - c. Brochures to be submitted shall be published by the Manufacturers and shall contain complete and detailed engineering and dimensional information. Brochures submitted shall contain only information relevant to the particular equipment or materials to be furnished. The Contractor shall not submit catalogs which describe several different items in addition to those items to be used, unless all irrelevant information is

marked out, or unless relevant information is clearly marked. Brochures from each manufacturer shall be identified and submitted separately.

1.8 OPERATION AND MAINTENANCE MANUALS:

- A. Provide operating instruction and maintenance data books for all equipment and materials furnished under this Division.

1.9 GUARANTEE:

- A. Ensure that electrical system installed under this contract is in proper working order and in compliance with drawings, specifications, and/or authorized changes. Without additional charge, replace any work or materials which develop defect, except from ordinary wear and tear, within one year from the date of substantial completion. Exception: Incandescent and fluorescent lamps shall be guaranteed for a period of two months from the date of substantial completion.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Products are specified by manufacturer name, description, and/or catalog number. Discrepancies between equipment specified and the intended function of equipment shall be brought to the attention of the Architect/Engineer in writing prior to bidding. Failure to report any conflict, including catalog numbers, discontinued products, etc., does not relieve the Contractor from meeting the intent of the contract documents nor shall it change the contract cost. If the Contractor is unable to interpret any part of the plans and/or specifications, or should he find discrepancies therein, he shall bring this to the attention of the Architect/Engineer who will issue interpretation and/or additional instructions to Bidders before the project is bid.

2.2 MANUFACTURERS:

- A. Provide products of manufacturers specified. Manufacturers catalog numbers and descriptions establish the quality of product required. Substitutions will be considered if a duplicate written application (2-copies) is at the office of the Architect/Engineer eight (8) working days prior to the day of the bidding. The application shall include the following: 1) A statement certifying that the equipment proposed is equal to that specified; that it has the same electrical and physical characteristics, compatible dimensions, and meets the functional intent of the contract documents; 2) The specified and submittal catalog numbers of the equipment under consideration; 3) A pictorial and specification brochure.
- B. Any conflict arising from the use of substituted equipment shall be the responsibility of the Contractor, who shall bear all costs required to make the equipment comply with the intent of the contract documents.
- C. No materials or apparatus may be substituted after the bid opening except where the equipment specified has been discontinued.
- D. Provide only equipment specified in the Contract Documents or approved by addendum.

2.3 SPARE PARTS:

- A. Provide spare parts (fuses, diffusers, lamps, etc.) as specified. Transmit all spare parts to Owner's Representative prior to substantial completion.

PART 3 – EXECUTION

3.1 INSTALLATION:

- A. Layout electrical work in advance of construction to eliminate unnecessary cutting, drilling, channeling, etc. Where such cutting, drilling, or channeling becomes necessary for proper installation; perform with care. Use skilled mechanics of the trades involved. Repair damage to building and equipment at no additional cost to the contract. Cutting work of other Contractors shall be done only with the consent of that Contractor. Cutting structural members shall not be permitted.
- B. Since the drawings of floor, wall, and ceiling installation are made at small scale; outlets, devices, equipment, etc., are indicated only in their approximate location unless dimensioned. Locate outlets and apparatus symmetrically on floors, walls and ceilings where not dimensioned, and coordinate such locations with work of other trades to prevent interferences. Verify all dimensions on the job. Do not scale the electrical drawings, but refer to the architectural and mechanical shop drawings and project drawings for dimensions as applicable.
- C. Provide block-outs, sleeves, demolition work, etc., required for installation of work specified in this division.

3.2 CLEAN:

- A. Clean up all equipment, conduit, fittings, packing cartons and other debris that is a direct result of the installation of the work of this Division.
- B. Clean fixtures, interiors and exteriors of all equipment, and raceways. Replace all filters in electrical equipment upon request for Substantial Completion.

3.3 STORAGE AND PROTECTION OF MATERIALS:

- A. Provide storage space for storage of materials and apparatus and assume complete responsibility for all losses due to any cause whatsoever. In no case shall storage interfere with traffic conditions in any public thoroughfare or constitute a hazard to persons in the vicinity. Protect completed work, work underway, and apparatus against loss or damage.

3.4 FIRE PENETRATION SEALS:

- A. Seal all penetrations for work of this section through fire rated floors, walls and ceilings to prevent the spread of smoke, fire, toxic gas or water through the penetration either before, during or after fire. The fire rating of the penetration seal shall be at least that of the floor, wall or ceiling into which it is installed, so that the original fire rating of the floor or wall is maintained as required by Article 300-21 of the National Electrical Code. Where applicable, provide OZ Type CFSF/I and CAFSF/I fire seal fittings for conduit and cable penetrations through concrete and masonry walls, floors, slabs, and similar structures. Where applicable, provide 3M fire barrier sealing penetration system, and/or IPC Flame Safe Fire Stop System, and/or Chase Foam fire stop system, including wall wrap, partitions, caps, and other accessories as required. All materials to comply with UL 1479 (ASTM E-814). Comply with manufacturer's instructions and recommendations for installation of sealing fittings and barrier sealing systems.

3.5 FINAL REVIEW:

- A. At the time of final review, the project foreman shall accompany the reviewing party, and remove coverplates, panel covers and other access panels as requested, to allow review of the entire electrical system.

END OF SECTION 260500

SECTION 260519 - CONDUCTORS AND CABLES (600V AND BELOW)

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. This section is a Division-26 Basic Materials and Methods section, and is part of each Division-26 section making reference to conductors and cables specified herein.

1.2 DESCRIPTION OF WORK:

- A. Extent of electrical conductor and electrical cable work is indicated by drawings and schedules.
- B. Types of conductors and cables in this section include the following:
 - 1. Copper Conductors (600V)
- C. Applications for conductors and cables required for project include:
 - 1. Branch Circuits

1.3 QUALITY ASSURANCE:

- A. Comply with NEC as applicable to construction and installation of electrical conductors and cable. Comply with UL standards and provide electrical conductors and cables which have been UL-listed and labeled.
- B. Comply with applicable portions of NEMA/Insulated Cable Engineers Association standards pertaining to materials, construction and testing of conductors and cable.
- C. Comply with applicable portions of ANSI/ASTM and IEEE standards pertaining to construction of conductors and cable.

1.4 SUBMITTALS:

- A. Not required.

PART 2 - PRODUCTS

2.1 COPPER CONDUCTORS (600V):

- A. Provide factory-fabricated conductors of sizes, ratings, materials, and types indicated for each service. Where not indicated provide proper selection to comply with project's installation requirements and NEC standards. Provide conductors in accordance with the following:
 - 1. Branch Circuit Conductors and All Conductors #3 AWG and Smaller - Copper conductor, with THHN/THWN insulation. Size all conductors in accordance with NEC; minimum size to be #12 AWG. Provide stranded conductors for #8 AWG and larger.

- B. Provide color and coding of conductors as follows:
- 120/208V
 - A-Phase - Black
 - B-Phase - Red
 - C-Phase - Blue
 - Neutral - White
 - Ground - Green
- C. Provide colors for switch legs, travelers and other wiring for branch circuits different than listed above.
- D. Provide neutral conductor for all branch circuit home runs.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Install electric conductors and cables as indicated, in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standards of Installation", and in accordance with recognized industry practices.
- B. Coordinate installation work with electrical raceway and equipment installation work, as necessary for proper interface.
- C. Nonmetallic jacketed cables of small size may be pulled directly by conductors by forming them into a loop to which pull wire can be attached; remove insulation from conductors before forming the loop.

3.2 AFTER INSTALLATION TEST FOR CABLE 600 VOLTS AND BELOW:

- A. Prior to energization, test cable and wire for continuity of circuitry, and for short circuits.
- B. Subsequent to wire and cable connections, energize circuitry and demonstrate functioning in accordance with requirements.

END OF SECTION 260519

SECTION 260529 - SUPPORTING DEVICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification section, apply to work of this section.
- B. This section is a Division-26 Basic Materials and Methods section making reference to supports, anchors, sleeves, and seals, specified herein.

1.2 DESCRIPTION OF WORK:

- A. Extent of supports, anchors, and sleeves is indicated by drawings and schedules and/or specified in other Division-26 sections. See Section 260532, Raceways, for additional requirements.
- B. Work of this section includes supports, anchors, sleeves and seals required for a complete raceway support system, including but not limited to: clevis hangers, riser clamps, C-clamps, beam clamps, one and two hole conduit straps, offset conduit clamps, expansion anchors, toggle bolts, threaded rods, U-channel strut systems, threaded rods and all associated accessories.

1.3 QUALITY ASSURANCE:

- A. Comply with NEC as applicable to construction and installation of electrical supporting devices. Comply with applicable requirements of ANSI/NEMA Std. Pub No. FB 1, "Fittings and Supports for Conduit and Cable Assemblies". Provide electrical components which are UL-listed and labeled.

PART 2 - PRODUCTS

2.1 MANUFACTURED SUPPORTING DEVICES:

A. GENERAL:

- 1. Provide supporting devices; complying with manufacturer's standard materials, design and construction in accordance with published product information, and as required for a complete installation; and as herein specified. See drawings for additional requirements.

PART 3 - EXECUTION

3.1 INSTALLATION OF SUPPORTING DEVICES:

- A. Install hangers, anchors, sleeves, and seals as required, in accordance with manufacturer's written instructions and with recognized industry practices to insure supporting devices comply with requirements. Comply with requirements of NECA, NEC and ANSI/NEMA for installation of supporting devices.
- B. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.
- C. Install hangers, supports, clamps and attachments to support piping properly from

building structures.

D. RACEWAYS:

- 1. Support raceways which are rigidly attached to structure at intervals not to exceed 8 feet on center, minimum of two straps per 10 foot length of raceway, and within 12" of each junction box, coupling, outlet or fitting. Support raceway at each 90 degree bend. Support raceway (as it is installed) in accordance with the following:

<u>NUMBER OF RUNS</u>	<u>3/4" TO 1-1/4" Ø</u>
1	Full straps, clamps or hangers.
2	Full straps, clamps or hangers.

- 2. Support suspended raceways on trapeze hanger systems; or individually by means of threaded rod and straps, clamps, or hangers suitable for the application. Do not use "tie wire" as a portion of any raceway support system; do not support raceway from ceiling support wires.

END OF SECTION 260529

SECTION 260532 - CONDUIT RACEWAYS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. This section is a Division-26 Basic Materials and Methods section, and is part of each Division-26 section making reference to electrical raceways and specified herein.

1.2 DESCRIPTION OF WORK:

- A. Extent of raceways is indicated by drawings and schedules.
- B. Types of raceways in this section include the following:
 - 1. Electrical Metallic Tubing
 - 2. Liquid-tight Flexible Metal Conduit
 - 3. Rigid Non-metallic Conduit

1.3 QUALITY ASSURANCE:

- A. MANUFACTURERS: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products have been in satisfactory use in similar service for not less than three (3) years.
- B. STANDARDS: Comply with applicable portions of NEMA standards pertaining to raceways. Comply with applicable portions of UL safety standards pertaining to electrical raceway systems; and provide products and components which have been UL-listed and labeled. Comply with NEC requirements as applicable to construction and installation of raceway systems.
- C. SUBMITTALS: Not required.

PART 2 – PRODUCTS

2.1 METAL CONDUIT AND TUBING:

- A. GENERAL:
 - 1. Provide metal conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) as indicated; with minimum trade size of 3/4".
- B. PVC EXTERNALLY COATED RIGID STEEL CONDUIT: ANSI C80.1 and NEMA Std. Pub. No. RN 1.
- C. ALUMINUM CONDUIT: Not acceptable.
- D. MC CABLE: Not acceptable.
- E. ELECTRICAL METALLIC TUBING (EMT): FS WW-C-563 and ANSI C80.3.
- F. EMT FITTINGS:

1. Provide insulated throat nylon bushings with non-indenter type malleable steel fittings at all conduit terminations. Install OZ Type B bushings on conduits 1" larger. Cast or indenter type fittings are not acceptable.

G. LIQUID TIGHT FLEXIBLE METAL CONDUIT:

1. Provide liquid-tight, flexible metal conduit; constructed of single strip, flexible continuous, interlocked, and double-wrapped steel; galvanized inside and outside; coated with liquid-tight jacket of flexible polyvinyl chloride (PVC).

H. LIQUID-TIGHT FLEXIBLE METAL CONDUIT FITTINGS: FS W-F-406, Type 1, Class 3, Style G.

- I. EXPANSION FITTINGS: OZ Type AX, or equivalent to suit application.

2.2 NON-METALLIC CONDUIT AND DUCTS:

A. GENERAL:

1. Provide non-metallic conduit, ducts and fittings of types, sizes and weights as indicated; with minimum trade size of 3/4".

B. UNDERGROUND PVC PLASTIC UTILITIES DUCT:

1. Minimum requirements shall be Type II for direct burial.

C. PVC AND ABS PLASTIC UTILITIES DUCT FITTINGS:

- D. ANSI/NEMA TC 9, match to duct type and material.

- E. HDPE CONDUIT: Not acceptable.

2.3 CONDUIT; TUBING; AND DUCT ACCESSORIES:

- A. Provide conduit, tubing and duct accessories of types and sizes, and materials, complying with manufacturer's published product information, which mate and match conduit and tubing. Provide manufactured spacers in all duct bank runs.

2.4 SEALING BUSHINGS:

- A. Provide OZ Type FSK, WSK, or CSMI as required by application. Provide OZ type CSB internal sealing bushings.

PART 3 - EXECUTION

3.1 INSTALLATION OF ELECTRICAL RACEWAYS:

- A. Install electrical raceways where indicated; in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA "Standard of Installation", and in accordance with the following:

1. BRANCH CIRCUITS, SIGNAL AND CONTROL CIRCUITS, AND INDIVIDUAL EQUIPMENT CIRCUITS RATED LESS THAN 100 AMPS:
 - a. Install in electric metallic tubing (EMT); except in poured walls, with one

side in contact with grade, below concrete slab-on-grade or in earth fill, install in non-metallic plastic duct. In areas exposed to weather, moisture, or physical damage, install in EMT.

- B. Coordinate with other work including metal and concrete deck work, as necessary to interface installation of electrical raceways and components.
- C. Install raceway in accordance with the following:
 - 1. Provide a minimum of 12" clearance measured from outside of insulation from flues, steam and hot water piping, etc. Avoid installing raceways in immediate vicinity of boilers and similar heat emitting equipment. Conceal raceways in finished walls and ceilings except in mechanical, electrical and/or communication rooms. Run concealed conduits in as direct a line as possible with gradual bends. Where conduit is exposed in mechanical spaces, etc., install parallel with or at right angles to building or room structural lines.
 - 2. Where cutting raceway is necessary, remove all inside and outside burrs; make cuts smooth and square with raceway. Paint all field threads (or portions of raceway where corrosion protection has been damaged) with primer and enamel finish coat to match adjacent raceway surface.
- D. Comply with NEC for requirements for installation of pull boxes in long runs.
- E. Cap open ends of conduits and protect other raceways as required against accumulation of dirt and debris. Pull a mandril and swab through all conduit before installing conductors. Install a 200 lb. nylon pull cord in each empty conduit run.
- F. Replace all crushed, wrinkled or deformed raceway before installing conductors.
- G. Do not use flame type devices as a heat application to bend PVC conduit. Use a heating device which supplies uniform heat over the entire area without scorching the conduit.
- H. Provide OZ expansion fittings on all conduits crossing building expansion joints.
- I. Complete installation of electrical raceways before starting installation of cables/conductors within raceways.
- J. Raceway installation below grade:
 - 1. Apply protective coating to metallic raceways in direct contact with earth or fill of any type; consisting of spirally wrapped PVC tape (1/2" minimum overlap of scotch wrap tape or equal); or factory applied vinyl cladding (minimum thickness .020 inches). Completely wrap and tape all field joints.
 - 2. Mark all buried conduits which do not require concrete encasement by placing yellow plastic marker tape (minimum 6" wide) along entire length of run 12" below final grade. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16", install a single line marker.
 - 3. Burial depths must comply with NEC Section 300-5 but in no case be less than 24", unless noted otherwise on drawings.

END OF SECTION 260532

SECTION 260533 - ELECTRICAL BOXES AND FITTINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.
- B. This section is a Division-26 Basic Materials and Methods section, and is a part of each Division-26, 27 and 28 section making reference to electrical wiring boxes and fittings specified herein. See Section 260532, Raceways, for additional requirements.

1.2 DESCRIPTION OF WORK:

- A. The extent of electrical box and electrical fitting work is indicated by drawings and schedules.
- B. Types of electrical boxes and fittings in this section include the following:
 - 1. Junction Boxes
 - 2. Conduit Bodies
 - 3. Bushings
 - 4. Locknuts
 - 5. Knockout Closures
 - 6. Miscellaneous Boxes and Fittings

1.3 QUALITY ASSURANCE:

- A. Comply with NEC as applicable to construction and installation of electrical boxes and fittings. Comply with ANSI C 134,1 (NEMA Standards Pub No. OS 1) as applicable to sheet-steel outlet boxes, device boxes, covers and box supports. Provide electrical boxes and fittings which have been UL-listed and labeled.

1.4 SUBMITTALS: None required

PART 2 - PRODUCTS

2.1 FABRICATED MATERIALS:

A. INTERIOR OUTLET BOXES:

- 1. Provide one piece, galvanized flat rolled sheet steel interior outlet wiring boxes with accessory rings, of types, shapes and sizes, including box depths, to suit each respective location and installation, construct with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box and covers and wiring devices; minimum size 4"x4"x1-1/2". Provide minimum 2-1/8" depth for boxes with three or more conduit entries.
- 2. Provide an 'FS' box, with no knockouts when surface mounted in a finished, non-utility space. Surface mounting is only acceptable when approved by the Architect.

B. INTERIOR OUTLET BOX ACCESSORIES:

- 1. Provide outlet box accessories as required for each installation, including

mounting brackets, hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and fulfilling requirements of individual wiring applications.

C. JUNCTION AND PULL BOXES:

1. Provide code-gage sheet steel junction and pull boxes, with screw-on covers; of types, shapes and sizes to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

D. CONDUIT BODIES:

1. Provide galvanized cast-metal conduit bodies, of types, shapes and sizes to suit respective locations and installation, construct with threaded-conduit-entrance ends, removable covers, and corrosion-resistant screws.

E. BUSHINGS, KNOCKOUT CLOSURES AND LOCKNUTS:

1. Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and malleable steel conduit bushings and offset connectors, of types and sizes to suit respective uses and installation.

PART 3 - EXECUTION

3.1 INSTALLATION OF ELECTRICAL BOXES AND FITTINGS:

A. GENERAL:

1. Install electrical boxes and fittings where indicated, complying with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.
2. Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work.
3. Provide coverplates for all boxes. See Section 262726, Wiring Devices.
4. Provide knockout closures to cap unused knockout holes where blanks have been removed.
5. Install boxes and conduit bodies to ensure ready accessibility of electrical wiring. Do not install boxes above ducts or behind equipment. Install recessed boxes with face of box or ring flush with adjacent surface. Seal between switch, receptacle and other outlet box openings and adjacent surfaces with plaster, grout, or similar suitable material.
6. Fasten boxes rigidly to substrates or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry. Use bar hangers for stud construction. Use of nails for securing boxes is prohibited. Set boxes on opposite sides of common wall with minimum 10" of conduit between them.
7. Provide electrical connections for installed boxes.

END OF SECTION 260533

SECTION 264119 – DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Special Provisions, Division 1 and Division-2 Specification sections, apply to work of this section.
- B. This section is a Division-26 Basic Materials and Methods section, and is part of each Division-26 section making reference to demolition.

1.2 DESCRIPTION OF WORK:

- A. Extent of major items of demolition work is indicated by drawings. Other demolition work shall be performed as required to maintain system operation.
- B. The intent of the drawings is to indicate major items affected and not to show every device, outlet, fixture, etc. affected by demolition work.
- C. The drawings do not necessarily reflect as-built conditions. The contractor shall visit the jobsite prior to bidding to determine the overall scope of demolition work.
- D. Refer to sections of other Divisions for applicable requirements affecting demolition work.
- E. Refer to Section 260500 for requirements with regard to power outages affecting the operation of existing electrical systems.

1.3 QUALITY ASSURANCE:

A. NEC COMPLIANCE:

- 1. Comply with applicable portions of NEC as to methods used for demolition work.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Demolition work shall be laid out in advance to eliminate unnecessary cutting, drilling, channeling, etc. Where such cutting, drilling, or channeling becomes necessary, perform with care, use skilled mechanics of the trades involved. Repair damage to building and equipment. Cutting work of other Contractors shall be done only with the consent of that Contractor. Cutting of structural members shall not be permitted.

2.2 PATCHING AND REPAIR

- A. The Contractor is responsible for all demolition, patching and repair of all finished interior surfaces pertaining to the installation of this particular phase of work. All surfaces shall be finished (painted, etc.) to match the adjacent materials, finishes and colors.
- B. Hard surfaces: Whenever demolition or excavation is required for the installation of the electrical system, it shall be the responsibility of this contractor to make repairs and/or replacements of hard finish surfaces such as concrete, asphalt, roofing, etc.

- C. The method of patching and repair shall follow good construction practices and all finished surfaces shall match materials and finish wherein the demolition occurred.

2.3 EXISTING EQUIPMENT

- A. The following is a part of this project and all costs pertaining thereto shall be included in the base bid.
- B. The new electrical equipment and apparatus shall be coordinated and connected into the existing system as required. Auxiliary systems shall comply, unless otherwise specified.
- C. The existing electrical devices, conduit and/or equipment that for any reason obstructs construction shall be relocated. Provide conduit, wiring, junction boxes, etc. as required to extend existing circuits and systems to relocated devices or equipment.
- D. The new fixtures indicated for existing outlets shall be installed in accordance with the fixture specifications.
- E. When installing equipment in the existing building, it shall be concealed.
- F. All existing electrical equipment and systems in portions of the building not being remodeled shall be kept operational, in service and in working condition throughout the entire construction period. Restore any circuits and systems interrupted. Provide temporary panels, temporary wiring and conduit, etc. as required.
- G. Maintain circuit integrity and continuity of all existing circuits and systems that interfere with or are interrupted by remodel work unless those circuits are to be abandoned completely. Maintain all circuits and systems in operation during construction. Provide temporary panels, temporary wiring and conduit, etc. as required.
- H. Existing raceways may be used where possible in place, except as noted. All circuits, conduit and wire that are not used in the remodeled area shall be removed back to the panelboard, where it shall be labeled a spare with circuit number indicated. Re-used raceway shall meet all requirements for new installations.
- I. Obtain permission from the Architect and Owner's representative before penetrating any ceiling, floor, and wall surfaces.
- J. Any and all equipment having electrical connections that require disconnecting and reconnection at the same or another location throughout the course of construction shall be included as part of this contract.

END OF SECTION 264119

SECTION 265100 - INTERIOR AND EXTERIOR BUILDING LIGHTING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Division-26 Basic Materials and Methods sections apply to work specified in this section.

1.2 DESCRIPTION OF WORK:

- A. Types of lighting fixtures in this section are indicated by schedule and include the following:
 - 1. High-Intensity-Discharge (HID)

1.3 QUALITY ASSURANCE:

- A. Comply with NEC, NEMA and ANSI 132,1 as applicable to installation and construction of lighting fixtures. Provide lighting fixtures which have been UL-listed and labeled.

1.4 SUBMITTALS:

A. PRODUCT DATA:

- 1. Submit manufacturer's data on interior and exterior building lighting fixtures.

B. SHOP DRAWINGS:

- 1. Submit dimensioned drawings of lighting fixtures. Submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in luminaire "type" alphabetical order, with proposed fixture and accessories clearly indicated on each sheet. Submit all available standard color samples with the shop drawings. If standard colors are not acceptable, a color sample will be provided to the fixture manufacturer. Return of the shop drawings will be delayed until color samples are provided. Submit ballast manufacturer cut sheets. Submit a list of all lamps used on all projects.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Subject to compliance with requirements, provide products of one of the following (for each type of fixture):
 - 1. HID MAGNETIC BALLASTS:
 - a. Advance Transformer Co.
 - b. Universal Lighting Technologies Co.
 - c. Venture Lighting International
 - 2. HID LAMPS:

- a. General Electric Co.
- b. Osram Sylvania
- c. Phillips Lighting Corp.
- d. Venture Lighting International

2.2 INTERIOR AND EXTERIOR LIGHTING FIXTURES:

A. GENERAL:

1. Provide lighting fixtures, of sizes, types and ratings indicated complete with, but not necessarily limited to, housings, lamps, lamp holders, reflectors, ballasts, starters, and wiring. Label each fixture with manufacturer's name and catalog number. Provide all enclosed fixtures with positive latch mechanisms; spring tension clips not acceptable. Provide all exterior fixtures with damp or wet location label as required by application.

B. SUPPORT REQUIREMENTS:

1. Provide all pendant and stem hung fixtures with flexible ball joint hangers at all points of support. Equip hooks used to hang fixtures with safety latches. Provide all detachable fixture parts, luminous ceiling accessories, louvers, diffusers, lenses, and reflectors with locking catches, screws, safety chain, or safety cable.
2. Comply with manufacturer's written recommendations for all lamp ballast combinations.
3. Equip outdoor fixtures with low temperature starting ballasts.

C. HIGH-INTENSITY-DISCHARGE-LAMP BALLASTS:

1. Provide HID ballasts, of ratings, types and makes as recommended by lamp manufacturer, which properly match lamps to power line by providing appropriate voltage and impedances for which lamps are designed. Equip exterior fixtures with low temperature starting ballasts. Provide high power factor, or power factor improved ballasts.

D. HID LAMPS:

1. Equip fixtures with HID lamps as specified. Provide coordinated lamp ballast combination to ensure full light output (rated lumens) of lamp. Where lamp manufacturer recommends operation of lamp in enclosed fixtures, provide suitable enclosure for fixtures specified. Include detailed drawing of enclosure with shop drawing submittal.

PART 3 - EXECUTION

3.1 INSTALLATION OF LIGHTING FIXTURES

- A. Install lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standards of Installation", NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.
- B. Coordinate with other work as appropriate to properly interface installation of lighting fixtures with other work.

- C. Provide all necessary supports, brackets, and miscellaneous equipment for mounting of fixtures.
- D. ADJUST AND CLEAN:
 - 1. Clean lighting fixtures of dirt and debris upon completion of installation.
 - 2. Protect installed fixtures from damage during remainder of construction period. Repair all nicks and scratches to appearance of original finish.
- E. SPARE PARTS:
 - 1. Provide a spare set of diffusers (acrylic and/or glass only) for each fixture type and one for each additional 10 fixtures of each type; not to exceed 10 spares for any single fixture type.
 - 2. In addition, furnish stock of replacement lamps amounting to 15 percent (but not less than one lamp) of each type and size used. Deliver replacement stock as directed to Owner's storage space.

3.2 FIELD QUALITY CONTROL:

- A. Upon completion of installation of lighting fixtures, and after building circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements.
- B. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise remove and replace with new units, and proceed with retesting.
- C. At the time of Substantial Completion, replace lamps in interior lighting fixtures which are observed to be noticeably dimmed after the Contractor's use and testing, as judged by Architect/Engineer.
- D. GROUNDING:
 - 1. Provide equipment grounding connections for each lighting fixture.

END OF SECTION 265100

DIVISION 31: EARTHWORK

31 0000 EARTHWORK

31 0501 COMMON EARTHWORK REQUIREMENTS

31 2000 EARTH MOVING

31 2216 FINE GRADING

31 2316 EXCAVATION

31 2323 FILL

END OF TABLE OF CONTENTS

SECTION 31 0501**COMMON EARTHWORK REQUIREMENTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited to:
 - 1. General procedures and requirements for earthwork.

PART 2 - PRODUCTS: Not Used**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Site Verification Of Conditions:
 - 1. 48 hours minimum before performing any work on site, contact Bluestakes to arrange for utility location services.
 - 2. Perform minor, investigative excavations to verify location of various existing underground facilities at sufficient locations to assure that no conflict with the proposed work exists and sufficient clearance is available to avoid damage to existing facilities.
 - 3. Perform investigative excavating 10 days minimum in advance of performing any excavation or underground work.
 - 4. Upon discovery of conflicts or problems with existing facilities, notify Architect by phone or fax within 24 hours. Follow telephone or fax notification with letter and diagrams indicating conflict or problem and sufficient measurements and details to evaluate problem.

3.2 PREPARATION

- A. Protection:
 - 1. Spillage:
 - a. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways.
 - b. Remove spillage and sweep, wash, or otherwise clean project, streets, and highways.
 - 2. Dust Control:
 - a. Take precautions necessary to prevent dust nuisance, both on-site and adjacent to public and private properties.
 - b. Correct or repair damage caused by dust.
- B. If specified precautions are not taken or corrections and repairs not made promptly, Owner may take such steps as may be deemed necessary and deduct costs of such from monies due to Contractor. Such action or lack of action on Owner's part does not relieve Contractor from responsibility for proper protection of The Work.

3.3 REPAIR / RESTORATION

- A. Adjust existing covers, boxes, and vaults to grade.

- B. Replace broken or damaged covers, boxes, and vaults.
- C. Independently confirm size, location, and number of covers, boxes, and vaults that require adjustment.

3.4 FIELD QUALITY CONTROL

- A. Field Inspections:
 - 1. Notify Architect 48 hours before performing excavation or fill work.
 - 2. If weather, scheduling, or any other circumstance has interrupted work, notify Architect 24 hours minimum before intended resumption of grading or compacting.
- B. Field Tests: Owner reserves right to require additional testing to re-affirm suitability of completed work including compacted soils that have been exposed to adverse weather conditions.

END OF SECTION

SECTION 31 2216**FINE GRADING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform fine grading work required to prepare site for paving finish grading.
- B. Related Requirements:
 - 1. Section 31 0501: Common Site Construction Requirements.
 - 2. Section 32 1216: Finish grading for asphalt paving.

PART 2 - PRODUCTS: Not Used**PART 3 - EXECUTION****3.1 PREPARATION**

- A. Protection: Protect utilities and site elements from damage.
- B. Surface Preparation:
 - 1. Before grading, dig out weeds from planting areas by their roots and remove from site. Remove rocks larger than 1-1/2 inches 38 mm in size and foreign matter such as building rubble, wire, cans, sticks, concrete, etc.
 - 2. Remove imported paving base material present in planting areas down to natural subgrade or other material acceptable to Architect.
 - 3. Limit use of heavy equipment to areas no closer than 6 feet 1800 mm from building or other permanent structures

3.2 PERFORMANCE

- A. Interface With Other Work: Do not commence work of this Section until grading tolerances specified in Section 31 2213 are met.
- B. Site Tolerances:
 - 1. Maximum variation from required grades shall be 1/10 of one foot 28 mm.
- C. Direct surface drainage in manner indicated on Drawings by molding surface to facilitate natural run-off of water. Fill low spots and pockets with specified fill material and grade to drain properly.

END OF SECTION

SECTION 31 2316**EXCAVATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform Project excavating and trenching as described in Contract Documents, except as specified below.
 - 2. Procedure and quality for excavating and trenching performed on Project under other Sections unless specifically specified otherwise.

- B. Related Requirements:
 - 1. Section 31 0501: Common Earthwork Requirements.
 - 2. Section 31 1100: Clearing and Grubbing.
 - 3. Performance of excavating outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.

PART 2 - PRODUCTS: Not Used**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Carefully examine site and available information to determine type soil to be encountered. Discuss problems with Architect before proceeding with work.

3.2 PREPARATION

- A. Protection of Existing Utilities:
 - 1. Protect existing utilities identified in Contract Documents during excavation.
 - 2. If existing utility lines not identified in Contract Documents contact local Building Maintenance.

3.3 PERFORMANCE

- A. Excavation:
 - 1. Canopy Footings:
 - a. Excavate as necessary for proper placement and forming of footings.
 - b. Bottom of excavations to receive footings shall be undisturbed soil.
 - c. Excavation Carried Deeper Than Required:
 - 1) Under Footings: Fill with concrete specified for footings.
 - 2. Pavement And Miscellaneous Cast-In-Place Concrete:
 - a. Excavate as necessary for proper placement and forming of concrete site elements and pavement structure. Remove vegetation and deleterious material and remove from site.
 - b. Backfill over-excavated areas with compacted base material specified in Section 31 2324.
 - c. Remove and replace exposed material that becomes soft or unstable.
 - 3. Utility Trenches:

- a. Unless otherwise indicated, excavation shall be open cut. Short sections of trench may be tunneled if pipe or duct can be safely and properly installed and backfill can be properly tamped in tunnel sections and if approved by Architect.
- b. Excavate to proper alignment, depth, and grade. Excavate to sufficient width to allow adequate space for proper installation and inspection of utility piping.
- c. If trenches are excavated deeper than required, backfill until trench bottom is proper depth with properly compacted native material.
- d. Pipe 4 Inches 100 mm In Diameter Or Larger:
 - 1) Grade bottom of trenches to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along its length.
 - 2) Except where rock is encountered, take care not to excavate below depths indicated.
 - a) Where rock excavations are required, excavate rock with minimum over-depth of 4 inches 100 mm below required trench depths.
 - b) Backfill over-depths in rock excavation and unauthorized over-depths with loose, granular, moist earth, thoroughly compacted.
 - 3) Whenever wet or unstable soil incapable of properly supporting pipe, as determined by Architect, occurs in bottom of trench, remove soil to depth required and backfill trench to proper grade with coarse sand, fine gravel, or other suitable material acceptable to Architect.
4. If unusual excavating conditions are encountered, stop work and notify Architect.

3.4 REPAIR / RESTORATION

- A. Repair damage to other portions of the Work resulting from work of this Section at no additional cost to Owner. On new work, arrange for damage to be repaired by original installer.

3.5 CLEANING

- A. Debris and material not necessary for Project are property of Contractor and are to be removed before completion of Project. However, if material necessary for Project is hauled away, replace with specified fill / backfill material.

END OF SECTION

SECTION 31 2323**FILL****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform Project backfilling and compacting.
 - 2. Procedure and quality for backfilling and compacting performed on Project under other Sections unless specifically specified otherwise.

- B. Related Requirements:
 - 1. Section 31 0501: Common Earthwork Requirements.
 - 2. Division 32: Compaction of sub-grade under walks and paving.
 - 3. Performance of backfilling and compacting outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM D 1557-02, 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.'
 - b. ASTM D 2216-98, 'Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.'
 - c. ASTM D 2487-00, 'Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).'
 - d. ASTM D 2922-05, 'Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).'
 - e. ASTM D 3017-05, 'Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).'

- B. Definitions:
 - 1. Relative Compaction: Ratio of field dry density as determined by ASTM D 2922 and ASTM D 3017 or 2216, and laboratory maximum dry density as determined by ASTM D 1557.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Site Material: Existing excavated material on site is suitable for use as fill and backfill to meet Project requirements.

- B. Imported Fill / Backfill:
 - 1. Well graded material conforming to ASTM D 2487 free from debris, organic material, frozen materials, brick, lime, concrete, and other material which would prevent adequate performance of backfill.

- a. Under Paved Areas: Fill shall comply with soil classification groups GW, GP, GM, SW, SP, or SM. Fill may not contain stones over **6 inches 150 mm** diameter and 90 percent minimum of fill shall be smaller than **1-1/2 inch 38 mm** in any direction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before placing fill, base, or finish work, prepare sub-grade as follows:
 - 1. Do not place fill or base over frozen sub-grade.
 - 2. Under Concrete Site Elements: Scarify sub-grade **6 inches 150 mm** deep, moisture condition to uniform moisture content of between optimum and 4 percent over optimum, and mechanically tamp **6 inches 150 mm** deep to 90 percent minimum of relative compaction.
 - 3. Under Asphalt Driveways And Parking Areas: Scarify sub-grade **6 inches 150 mm** deep, moisture condition to uniform moisture content between optimum and 4 percent over optimum, and mechanically tamp to 95 percent minimum of relative compaction.

3.2 PERFORMANCE

- A. Fill / Backfill:
 - 1. General:
 - a. Around Buildings And Structures: Slope grade away from building. Hand backfill when close to building or where damage to building might result.
 - b. Do not use puddling or jetting to consolidate fill areas.
 - 2. Compacting:
 - a. Fill / Backfill And Base:
 - 1) Under Parking Areas: Place in **8 inch 200 mm** maximum layers, moisture condition to plus or minus 2 percent of optimum moisture content, and mechanically tamp to 95 percent minimum of maximum density as established by ASTM D 1557.
 - 2) Under Concrete Site Elements And Around Foundation Walls: Place in **8 inch 200 mm** maximum layers, dampen but do not soak, and mechanically tamp to 90 percent minimum of maximum density as established by ASTM D 1557.
 - 3) Utility Trenches:
 - a) Site: Place fill in **12 inch 300 mm** layers and moisture condition to plus or minus 2 percent of optimum moisture content. Compact fill to 90 percent minimum relative compaction to within **12 inches 300 mm** of finish grade. Compact fill above **12 inches 300 mm** to 85 percent relative compaction.
 - b) Under Slabs: Place fill in **6 inch 150 mm** layers, moisture condition to plus or minus 2 percent of optimum moisture content, and compact to 95 percent minimum relative compaction to within **4 inches 100 mm** of finish grade. Final **4 inches 100 mm** of fill shall be granular base as specified in Section 31 2324.
 - 4) Fill Slopes: Compact by rolling or using sheepsfoot roller.
 - 5) Backfill Under Footings: Not allowed.
 - 6) Other Backfills: Place other fills in **12 inch 300 mm** layers and compact to 90 percent relative compaction.

3.3 REPAIR / RESTORATION

- A. Repair damage to other portions of the Work resulting from work of this Section at no additional cost to Owner. On new work, arrange for damage to be repaired by original installer.

3.4 CLEANING

- A. Debris and material not necessary for Project are property of Contractor and are to be removed before completion of Project. However, if material necessary for Project is hauled away, replace with specified fill / backfill material.

END OF SECTION

DIVISION 32: EXTERIOR IMPROVEMENTS

32 1000 BASES, BALLASTS, AND PAVING

32 1216 ASPHALT PAVING

32 1723 PAVEMENT MARKINGS

END OF TABLE OF CONTENTS

SECTION 32 1216**ASPHALT PAVING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Prepare pavement sub-grade as described in Contract Documents to receive pavement base and paving.
 - 2. Furnish and install pavement base and asphaltic concrete paving in parking areas as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 31 2323: Compaction procedures and tolerances for fill.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International:
 - a. ASTM C 131-03, 'Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.'
 - b. ASTM D 977-05, 'Standard Specification for Emulsified Asphalt.'
 - c. ASTM D 1075-96 (2005), 'Standard Test Method for the Effect of Water on Compressive Strength of Compacted Bituminous Mixtures.'
 - d. ASTM D 1188-96 (2002), 'Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Specimens.'
 - e. ASTM D 2027-97 (2004), 'Standard Specification for Cutback Asphalt (Medium-Curing Type).'
 - f. ASTM D 2041-03a, 'Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.'
 - g. ASTM D 2397-05, 'Standard Specification for Cationic-Emulsified Asphalt.'
 - h. ASTM D 2726-05a, 'Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.'
 - i. ASTM D 3381-05, 'Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.'

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
 - 1. Participate in pre-installation conference specified in Section 31 2213.
 - 2. Schedule paving pre-installation conference after staking of parking areas and installation of sleeves, but before installation of base and paving.

1.4 SUBMITTALS

- A. Informational Submittals:
 - 1. Design Data: Mix design of asphalt concrete mixture.
 - 2. Test And Evaluation Reports: Copies of test results from tests conducted to assure compliance to Contract Document requirements.

PART 2 - PRODUCTS**2.1 MATERIAL****A. Base:**

1. New Aggregate Base: 6" thick minimum.
 - a. Road Base type gravel or crushed stone, graded as follows:
 - 1) Sieve Percent by Weight Passing Sieve
 - a) 1 inch 100
 - b) 3/4 inch 85 - 100
 - c) No. 4 45 - 60
 - d) No. 10 30 - 50
 - e) No. 200 5 - 10 (non-plastic)
 - f) 25 mm 100
 - g) 19 mm 85 - 100
 - h) No. 4 45 - 60
 - i) No. 10 30 - 50
 - j) No. 200 5 - 10 (non-plastic)
 2. Recycled Aggregate Base: 6" thick minimum.
 - a. Pulverized existing asphalt or concrete paving mixed uniformly with existing aggregate base.
 - b. Conform to following gradation:
 - 1) Sieve Percent by Weight Passing Sieve
 - a) 2 Inch 100
 - b) 1-1/2 inch 85 - 100
 - c) 3/4 inch 60 - 80
 - d) No. 4 30 - 50
 - e) No. 200 5 - 12
 - f) 50 mm 100
 - g) 38 mm 85 - 100
 - h) 19 mm 60 - 80
 - i) No. 4 30 - 50
 - j) No. 200 5 - 12
 - c. Quality Requirements as established by testing:
 - 1) R-value: 70 minimum.
 - 2) Sand Equivalent: 25 minimum.
 - 3) Durability Index: 35 minimum.

- B. Tack Coat: Emulsified asphalt meeting requirements of either ASTM D 977, Grade SS-1H, or ASTM D 2397, Grade CSS-1H.

C. Pavement:

1. Asphalt Cement:
 - a. Meet requirements of ASTM D 3381, Viscosity grade (Original Asphalt) as follows:
 - 1) AC5 in cold climatic conditions.
 - 2) AC10 in moderate climatic conditions.
2. Aggregates:
 - a. Fine to coarse mineral aggregates with wear less than 40 percent as determined by ASTM C 131 and mineral filler suitable for pavement meeting following gradation requirements:
 - 1) Sieve Percent by Weight Passing Sieve
 - a) 3/4 inch 100
 - b) 1/2 inch 95 - 100
 - c) 3/8 inch 80 - 95
 - d) No. 4 54 - 71
 - e) No. 8 38 - 54
 - f) No. 30 17 - 32
 - g) No. 200 3 - 8 (non-plastic)
 - h) 19 mm 100
 - i) 3 mm 95 - 100

j)	9.5 mm	80 – 95
k)	No. 4	54 – 71
l)	No. 8	38 – 54
m)	No. 30	17 – 32
n)	No. 200	3 – 8 (non-plastic)

- b. Up to 15 percent by weight of total aggregates may consist of pulverized, recycled asphalt cement concrete pavement, providing aggregate grading requirements are met.

2.2 MIXES

- A. Central plant hot mix.
- B. Develop mix design according to Marshall Method to achieve optimum asphalt content as shown by test data curves based on testing samples containing 1/2 percent increments of asphalt content. Samples shall include minimum of two with asphalt content above optimum and two with asphalt content below optimum.
1. Make tests in accordance with ASTM D 1559 and ASTM D 1075 (50 blow count Marshall).
 2. Final design shall meet following criteria:
 - a. Stability: 1200 pounds 545 kg minimum.
 - b. Flow: 8 minimum, 18 maximum.
 - c. Air voids: 2 percent minimum, 4 percent maximum.
 - d. Voids in mineral aggregate: 15 percent minimum.
 - e. Asphalt cement by weight of total: 5 percent minimum.
 - f. Dry Strength: 200 psi 975 kg per sq m.
 - g. Index of Retained Strength: 75 percent.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Survey and stake parking surfaces to show grading required by Contract Documents.
- B. Sub-Grade:
 1. Finish grade parking surface area to grades required by Contract Documents.
 2. Compact sub-grade as specified in Section 31 2323.

3.2 INSTALLATION

- A. Tolerances:
 1. Sub-Grade: 0.00 inchesmm high. Measure using string line from curb to curb, gutter, flat drainage structure, or grade break.
 2. Base:
 - a. Base shall be 6 inches 150 mm thick minimum after compaction.
 - b. Measure using string line from curb to curb, gutter, flat drainage structure, or grade break.
 3. Paving:
 - a. Apply asphaltic concrete paving in single lift 3 inches 75 mm thick minimum after compaction.
 - b. Paving adjacent to cast-in-place concrete site elements shall be between 1/4 inch 6 mm higher than concrete and flush with concrete.
 - c. Surface texture of hand worked areas shall match texture of machine-laid areas.
- B. Base:
 1. If roller is smaller than 8 ton 7260 kg, lay gravel and compact in two courses.
 2. Compact as specified in Section 31 2323.
 3. Remove or repair improperly prepared areas as directed by Architect.

- C. Asphalt Paving:
1. Tack coat vertical concrete surfaces that will be in contact with paving.
 2. Uniformly mix materials so aggregate is thoroughly coated with asphalt.
 3. Place at temperatures between 250 and 325 deg F 120 and 163 deg C with a self-propelled laydown machine.
 4. Longitudinal bituminous joints shall be vertical and properly tack coated if cold. Transverse joints shall always be tack coated.
 5. Compaction:
 - a. Compact asphalt paving to 96 percent minimum. Determine percent compaction by dividing density of test cores as determined by either ASTM D 1188 or ASTM D 2726 by laboratory compacted density as determined by ASTM D 1559. Maximum total air voids in completed asphaltic concrete shall be 8 percent as determined by ASTM D 2041.
 - b. Roll with powered equipment capable of obtaining specified density.
 - c. Begin breakdown rolling immediately after asphalt is placed when asphalt temperature is at maximum. Complete breakdown rolling before mix temperature drops below 240 deg F 115 deg C. Complete handwork compaction concurrently with breakdown rolling.
 - d. Complete intermediate rolling as soon as possible after breakdown rolling and before mix temperature drops below 185 deg F 85 deg C. Do not roll paving for compaction purposes after asphalt temperature falls below 185 deg F 85 deg C.
 - e. Execute compaction so visibility of joints is minimized. Complete finish rolling to improve asphalt surface as soon as possible after intermediate rolling and while asphalt paving is still warm. Do not use vibration for finish rolling.
 6. Surface shall be uniform with no 'birdbaths.' Leave finished surfaces clean and smooth. Variations from specified grades shall not exceed 1/2 inch 13 mm.

3.3 FIELD QUALITY CONTROL

- A. Field Tests: When tested with 10 foot 3 meter straight edge, surface of completed work shall not contain irregularities in excess of 1/4 inch 6 mm.
- B. Laboratory Tests:
1. Agency will select testing laboratory and select test locations, an equal number from near edges of paving and at random in field. Agency will pay for laboratory services.
 2. Arrange for selected laboratory to make tests after completion of work of this Section. After testing, repair test locations as necessary and remove and replace work not in compliance with Contract Documents at no additional cost to Owner.
 3. Testing laboratory will perform one test series for every 10,000 sq ft 900 sq M of parking.
 - a. Tests reports will show compliance with Contract Documents regarding type of sub base, depth and density of base, depth and density of paving, and in materials used. Reports will also give test procedures used by testing laboratory.
 - b. Testing laboratory will forward three copies of test report to Architect.

END OF SECTION

SECTION 32 1723**PAVEMENT MARKINGS****PART 1 - GENERAL****1.1 SUMMARY**

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

1.2 QUALITY ASSURANCE

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

1.3 FIELD CONDITIONS

- A. Ambient Conditions:
1. Apply only on dry surfaces, during favorable weather, and when damage by rain, fog, or condensation not anticipated.
 2. Latex Paint:
 - a. Atmospheric temperature above 50 deg F 10 deg C.
 - b. When temperature is not anticipated to drop below 50 deg F 10 deg C during drying period.
 3. Alkyd or Chlorinated Rubber Paint:
 - a. Atmospheric temperature above 40 deg F 4 deg C.
 - b. When temperature is not anticipated to drop below 40 deg F 4 deg C during drying period.

PART 2 - PRODUCTS**2.1 MATERIAL**

- A. Paint:
1. Non-reflectorized.
 2. Types:
 - a. Acrylic Latex for uncured paving.
 - b. Alkyd or chlorinated rubber for cured paving.
 3. Colors:
 - a. Yellow: Parking stripes, crosswalk stripes, and safety markings.
 - b. Blue And White: Handicapped markings.
 4. Type Two Acceptable Products:
 - a. 442XX Traffic Marking Paint by ICI Devoe, Cleveland, OH www.devoepaint.com.
 - b. Set-Fast Traffic Marking Paint by Sherwin-Williams, Cleveland, OH www.sherwin-williams.com
 - c. Equal as approved by Architect before application.
- B. Preformed Thermoplastic:
1. Reflectorized.
 2. Colors:
 - a. Yellow: Parking stripes, crosswalk stripes, and safety markings.
 - b. Blue And White: Handicapped markings.
 - c. Red: Fire lanes and no parking zones.
 3. Approved Product.

- a. Premark Plus by Flint Trading Inc, Thomasville, NC www.flintrading.com.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not apply acrylic latex system until paving has cured 7 days minimum. Do not apply alkyd or chlorinated rubber systems until paving has cured 3 months minimum.
- B. Surfaces shall be dry and free of grease and loose dirt particles. Scrape and wire brush chipped or damaged paint on existing curbs.
- C. Perform layout with chalk or lumber crayon only.

3.2 APPLICATION

- A. Tolerances:
 1. General: Make lines parallel, evenly spaced, and with sharply defined edges.
 2. Line Widths:
 - a. Plus or minus **1/4 inch 6 mm** variance on straight segments.
 - b. Plus or minus **1/2 inch 13 mm** variance on curved alignments.
- B. Provide two coat application, each coat applied at 150 sq ft per gal. Apply second coat after three hours minimum or when first coat is thoroughly dried, whichever is longer.

3.3 CLEANING

- A. Remove drips, overspray, improper markings, and paint material tracked by traffic by sand blasting, wire brushing, or other method approved by Architect before performance.

END OF SECTION

DIVISION 33: UTILITIES

33 4000 STORM DRAINAGE UTILITIES

33 4116 SITE STORM UTILITY DRAINAGE PIPING

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SECTION 33 4116**SITE STORM UTILITY DRAINAGE PIPING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform excavating and backfilling required for work of this Section.
 - 2. Furnish and install storm drainage system as described in Contract Documents from point of water collection to terminating point.
- B. Related Requirements:
 - 1. Section 31 2316: Procedure and quality of excavating.
 - 2. Section 31 2323: Procedure and quality of backfilling and compacting.

1.2 REFERENCES

- A. Reference Standards:
 - 1. American Association Of State Highway And Transportation Officials:
 - a. AASHTO M-252, 4 to 10 inch 100 to 250 mm pipe, 'Specifications for Corrugated Polyethylene Pipe.'
 - b. AASHTO M-294, 12 to 48 inch 300 to 1200 mm pipe, 'Specifications for Corrugated Polyethylene Pipe.'
 - 2. ASTM International:
 - a. ASTM A 74-05, 'Standard Specification for Cast Iron Soil Pipe and Fittings.'
 - b. ASTM A 536-84 (2004), 'Standard Specification for Ductile Iron Castings.'
 - c. ASTM A 929-01, 'Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe.'
 - d. ASTM C 14-05a, 'Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.'
 - e. ASTM C 76-05b, 'Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.'
 - f. ASTM C 564-03a, 'Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.'
 - g. ASTM D 2321-05, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.'
 - h. ASTM D 3034-04a, 'Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.'
 - i. ASTM D 3212-96a (2003), 'Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.'
 - j. ASTM F 794-03, 'Standard Specification for Poly(Vinyl Chloride)(PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.'
 - k. ASTM F 1336-02, 'Standard Specification for Poly(Vinyl Chloride)(PVC) Gasketed Sewer Fittings.'

PART 2 - PRODUCTS**2.1 SYSTEM**

- A. Materials:
 - 1. Bedding Material: 3/8 inch 10 mm crushed gravel.
 - 2. Catch Basins, Curb Inlets, Etc:

- a. Concrete:
 - 1) Construct of 4000 psi minimum concrete.
 - 2) Include cover inlet with cast iron frame and grate as shown on Drawings.
- 3. PVC Pipe And Fittings:
 - a. Meet requirements of ASTM D 3034, SDR 35 or CAN / CSA 182.1.
 - b. Fittings: Slip Joint type with elastomeric seals.
- 4. Corrugated Polyethylene Pipe And Fittings:
 - a. Meet requirements of AASHTO M-252 or M-294, Type S.
 - 1) Corrugated, helical or annular, exterior with smooth interior and gasketed connectors.
 - 2) Corrugated, annular, with silt and watertight joints for storm sewers.
- 5. Corrugated Metal Pipe:
 - a. Meet requirements of ASTM A 929.
 - b. 16 gauge, standard round, galvanized with 2 ounces zinc per square foot sheet steel.
 - c. Corrugations:
 - 1) 6 to 10 Inch 150 to 250 mm Pipe: 1-1/2 by 1/4 inch 38 by 6 mm depth helical corrugations.
 - 2) 12 to 60 Inch 300 to 1 500 mm Pipe: 2-2/3 by 1/2 inch 58 by 12.5 mm depth helical corrugations.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Excavate and backfill as specified in Section 31 2316 and 31 2323 with following additional requirements:
 - 1. Runs shall be as close as possible to those shown on Drawings.
 - 2. Excavate to required depth.
 - 3. Grade to obtain fall required.
 - 4. Remove debris from trench before laying bedding and pipe.
 - 5. Do not cut trenches near footings without consulting Architect.
 - 6. Backfill only after pipe lines have been tested, inspected, and approved by Architect.

3.2 INSTALLATION

- A. PVC / Polyethylene Pipe:
 - 1. Install in accordance with ASTM D 2321.
 - 2. Minimum cover for corrugated polyethylene pipe and fittings shall be 12 inches 300 mm for H-20 load.
- B. Use jacks to make-up gasketed joints.

3.3 FIELD QUALITY CONTROL

- A. Failure to install joints properly shall be cause for rejection and replacement of piping system.

3.4 CLEANING

- A. Remove excess earth from site or place as directed by Architect.

END OF SECTION