



STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

**Division of Facilities Construction and Management**

**DFCM**

**STANDARD LOW BID PROJECT  
Project Budgets Over \$100,000**

**August 4, 2009**

**RAMPTON COMPLEX BUILDING SOUTH PARKING  
LOT ADDITION**

**UTAH DEPARTMENT OF TRANSPORTATION**

**SALT LAKE CITY, UTAH**

DFCM Project Number 08213900

McNeil Group  
6895 South 900 East  
Midvale, Utah 84047

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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:

**RAMPTON COMPLEX BUILDING SOUTH PARKING LOT ADDITION**  
**UTAH DEPARTMENT OF TRANSPORTATION – SALT LAKE CITY, UTAH**  
**DFCM PROJECT NO: 08213900**

Bids will be in accordance with the Contract Documents that will be available on **Tuesday, August 4, 2009**, and distributed in electronic format only on CDs from DFCM, 4110 State Office Building, Salt Lake City, Utah and on the DFCM web page at <http://dfcm.utah.gov>. For questions regarding this project, please contact Brent Lloyd, DFCM, at 801-550-5882. No others are to be contacted regarding this bidding process. The construction estimate for this project is \$279,000.00.

A **mandatory** pre-bid meeting will be held at **10:00 AM** on **Monday, August 10, 2009** at UDOT Rampton Complex Maintenance Offices located at 4501 South 2700 West in the Southeast corner of the facility. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of **3:00 PM** on **Wednesday, August 19, 2009** at DFCM, 4110 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. NOTE: Bids must be received at 4110 State Office Building by the specified time.

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

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

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

## PROJECT DESCRIPTION

This project is comprised of the construction of a new parking lot on the south side of the Rampton Complex Building. The new lot is approximately 16,000 SF with concrete curb & gutter, storm drain modification and installation, and a pre-fabricated steel cover over a portion of the stalls. It will be a secure lot with chain link fencing on the perimeter and an electronic gate.

The challenge in the project will be accomplishing the work while the facility is open to the staff as well as the public. It is located between a main driveway entrance and a pedestrian entrance to the facility. Traffic control and safety are issues the contractor will need to consider. The Contractor's communication of scheduling and construction progress with the Facility Coordinator throughout the project will be imperative.

**PROJECT SCHEDULE**

**PROJECT NAME: RAMPTON COMPLEX BUILDING SOUTH PARKING LOT ADDITION**  
**UTAH DEPARTMENT OF TRANSPORTATION – SALT LAKE CITY, UTAH**  
**DFCM PROJECT NO. 08213900**

Event	Day	Date	Time	Place
Bidding Documents Available	Tuesday	August 4, 2009	2:00 PM	DFCM 4110 State Office Bldg SLC, UT and the DFCM web site *
<b>Mandatory</b> Pre-bid Site Meeting	Monday	August 10, 2009	10:00 AM	UDOT Rampton Complex Maintenance Offices – 4501 So. 2700 West, WVC, Utah – SE corner of the facility
Last Day to Submit Questions	Wednesday	August 12, 2009	10:00 AM	Brent Lloyd – DFCM brentlloyd@utah.gov Fax 801-538-3267
Addendum Deadline (exception for bid delays)	Monday	August 17, 2009	2:00 PM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Wednesday	August 19, 2009	3:00 PM	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Thursday	August 20, 2009	3:00 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	October 30, 2009	4:00 PM	

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



## BID FORM

NAME OF BIDDER \_\_\_\_\_ DATE \_\_\_\_\_

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

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the **Rampton Complex Building South Parking Lot Addition – Utah Department of Transportation – Salt Lake City, Utah – DFCM Project No. 08213900** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: \_\_\_\_\_

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

\_\_\_\_\_ DOLLARS (\$\_\_\_\_\_)

(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by October 30, 2009, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **\$250.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

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

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

The undersigned Contractor's License Number for Utah is \_\_\_\_\_.

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

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable 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: \_\_\_\_\_ Attorney-in-Fact (Seal)

STATE OF \_\_\_\_\_ )  
 ) ss.  
COUNTY OF \_\_\_\_\_ )

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

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

My commission expires: \_\_\_\_\_  
Resides at: \_\_\_\_\_

NOTARY PUBLIC

**Agency:** \_\_\_\_\_  
**Agent:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**Phone:** \_\_\_\_\_

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



CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT \_\_\_\_\_ PROJECT NO: \_\_\_\_\_

AGENCY/INSTITUTION \_\_\_\_\_

AREA ACCEPTED \_\_\_\_\_

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

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

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

\_\_\_\_\_

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

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

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

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

\_\_\_\_\_ by: \_\_\_\_\_  
CONTRACTOR (include name of firm) (Signature) DATE

\_\_\_\_\_ by: \_\_\_\_\_  
A/E (include name of firm) (Signature) DATE

\_\_\_\_\_ by: \_\_\_\_\_  
USING INSTITUTION OR AGENCY (Signature) DATE

\_\_\_\_\_ by: \_\_\_\_\_  
DFCM (Owner) (Signature) DATE

**General Contractor Performance Rating Form**

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

Rating Guideline	QUALITY OF PRODUCT OR SERVICES	COST CONTROL	TIMELINESS OF PERFORMANCE	BUSINESS RELATIONS
<b>5-Exceptional</b>	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"			
<b>4-Very Good</b>	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
<b>3-Satisfactory</b>	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
<b>2-Marginal</b>	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
<b>1-Unsatisfactory</b>	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

<b>1. Rate Contractors quality of workmanship, management of sub contractor performance, project cleanliness, organization and safety requirement.</b>	<b>Score</b>
<u>Agency Comments:</u>	
<u>A &amp; E Comments:</u>	
<u>DFCM Project Manager Comments:</u>	

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

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

<b>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.</b>	<b>Score</b>
<u>Agency Comments:</u>	
<u>A &amp; 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
---	-------

Agency Comments:

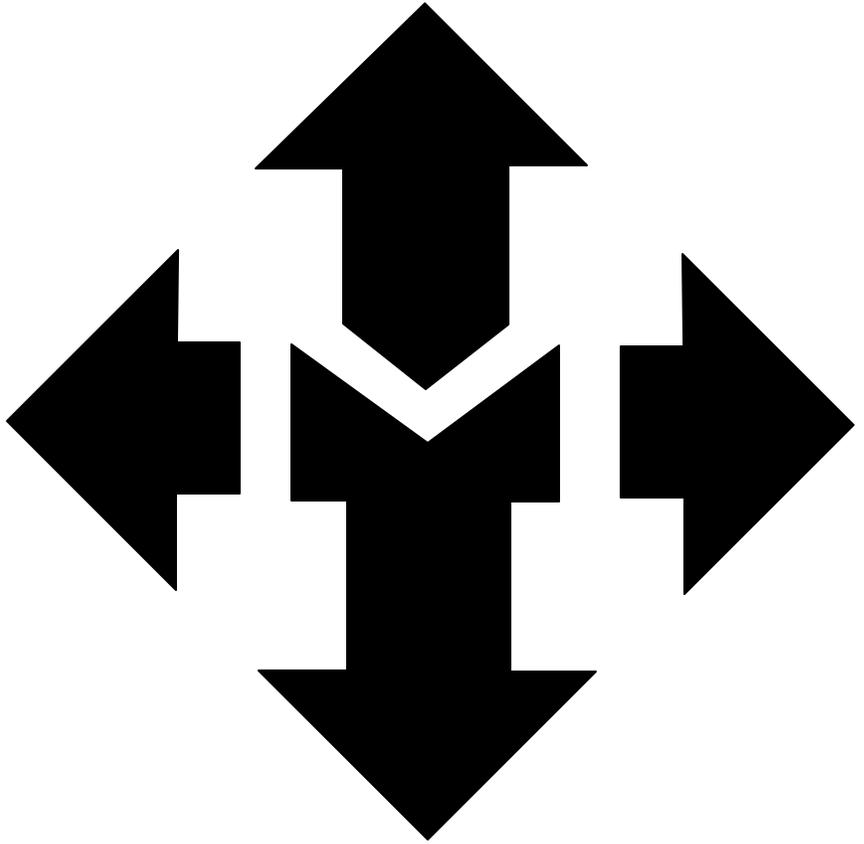
A & E Comments:

DFCM Project Manager Comments:

<b>Signed by:</b>	<b>Date:</b>	<b>Mean Score</b>
-------------------	--------------	-------------------

**Additional Comments:**

[Large shaded area for additional comments]



**Project Manual**

for

**Calvin Rampton Complex  
Parking Lot Addition  
4501 South 2700 West  
Salt Lake City, Utah**

for

**State of Utah Department of Administrative Services  
Division of Facilities Construction & Management  
DFCM Project #08213900**

**July 2009**

**McNeil Group, Inc.  
6895 South 900 East  
Midvale, Utah 84047**

**(801) 255-7700  
info@mcneileng.com  
www.mcneileng.com**

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**DIVISION 02: EXISTING CONDITIONS**

**02 4000**

02 4113 SELECTIVE SITE DEMOLITION

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**SECTION 02 4113****SELECTIVE SITE DEMOLITION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Demolish and remove portions of existing site facilities as described in Contract Documents.
- B. Related Requirements:
  - 1. New and replacement work specified in appropriate specification Sections.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Scheduling: Include on Construction Schedule specified in Section 01 3200 detailed sequence of individual site demolition operations.

**1.3 SUBMITTALS**

- A. Closeout Submittals:
  - 1. Record Documentation: Identify abandoned utility and service lines and capping locations on record drawings.

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

- A. Notify corporations, companies, individuals, and local authorities owning conduits running to property.
  - 1. Protect and maintain conduits, drains, sewers, pipes, and wires that are to remain on the property.
  - 2. Arrange for removal of wires running to and on property. Remove pipes and sewers in accordance with instructions of above owners.

**3.2 PERFORMANCE**

- A. Execute work in an orderly and careful manner, with due consideration for neighbors and the public.
- B. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work. Coordinate with Owner for equipment and materials to be removed by Owner.
- C. Concrete And Paving Removal:
  - 1. Saw cut joints between material to be removed and material to remain to full depth.
  - 2. Hand-excavate trench **12 inches (300 mm)** wide and **16 inches (400 mm)** deep along concrete or paving to be removed. Cut roots encountered with saw, axe, or pruner. Do not cut roots with excavating equipment. Remove roots under concrete and paving to be replaced down to **12 inches (300 mm)** below finish grade.

**3.3 CLEANING**

- A. Keep streets and roads reasonably clean, and sweep daily.
- B. Sprinkle demolition rubbish and debris as necessary to lay dust.
- C. Promptly remove demolition materials, rubbish, and debris from property.

**END OF SECTION**

**DIVISION 03: CONCRETE**

**03 1000 CONCRETE FORMING AND ACCESSORIES**

03 1113 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING  
03 1511 ANCHORS AND INSERTS

**03 2000 CONCRETE REINFORCING**

03 2100 REINFORCING STEEL

**03 3000 CAST-IN-PLACE CONCRETE**

03 3053 MISCELLANEOUS CAST-IN-PLACE CONCRETE  
03 3111 NORMAL WEIGHT STRUCTURAL CONCRETE  
03 3923 MEMBRANE CONCRETE CURING

**03 6000 GROUTING**

03 6213 NON-METALLIC NON-SHRINK GROUT

END OF TABLE OF CONTENTS

**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.

**1.2 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).'

**1.3 SUBMITTALS**

- A. Informational Submittals:
  - 1. Manufacturer Instructions: Printed application instructions for form release agents.

**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](http://www.cresset.com).
      - 2) Clean Strip (J-1 or J-3 VOC) by Dayton Superior Specialty Chemicals, Kansas City, KS [www.daytonsuperiorchemical.com](http://www.daytonsuperiorchemical.com).
      - 3) E-Z Strip or DEBOND Form Coating by L & M Construction Chemicals, Omaha, NE [www.lmcc.com](http://www.lmcc.com).
      - 4) Q-2 by Unitex, Kansas City, MO [www.unitex-chemicals.com](http://www.unitex-chemicals.com).

- 5) U S Spec SlicKote by U S Mix Products Co [www.usspec.com](http://www.usspec.com).
  - 6) Duogard or Duogard II by W R Meadows, Elgin, IL [www.wrmeadows.com](http://www.wrmeadows.com).
  - 7) Equal as approved by Architect before use. See Section 01 6200.
- 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](http://www.aknightcompany.com).
      - 2) Sealtight by W R Meadows Inc, Hampshire, IL [www.wrmeadows.com](http://www.wrmeadows.com).
      - 3) Equal as approved by Architect before installation. See Section 01 6200.
  3. Recycled Vinyl:
    - a. Light gray color.
    - b. Type Two Acceptable Products:
      - 1) Proflex by Oscoda Plastics Inc, Oscoda, MI [www.oscodaplastics.com](http://www.oscodaplastics.com).
      - 2) Equal as approved by Architect before Installation. See Section 01 6200.

## 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. Provide temporary cleanouts at base of tall forms to facilitate cleaning and inspection.
  4. Make proper form adjustments before, during, and after concreting.
  5. 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.
  6. Use metal cold joint forms when unable to place concrete for footings, foundations, and slabs in continuous pours.
  7. Provide beveled **2 inch by 4 inch** keys where shown on Drawings for tall or heavily loaded walls.
- 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 foundation wall where shown on Drawings.
- 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.
  - 2. Drilled-in mechanical anchors for concrete.
  - 3. Drilled-in adhesive anchors and inserts for concrete.
  - 4. Concrete anchors and inserts not specified elsewhere.
- B. Related Requirements:
  - 1. Section 03 3111: Installation of cast-in-place anchors and inserts.
  - 2. Section 06 1100: Installation of drilled in anchors.

**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.
- B. Informational Submittals:
  - 1. Test And Evaluation Reports: ICC ES Evaluation Report indicating conformance with the current applicable ICC ES Acceptance Criteria.
  - 2. Manufacturer's Instructions: Manufacturer's published installation recommendations 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.
4. Drilled-in Adhesive Anchors:
  - a. Cartridge Injection Adhesive Anchors.
  - b. Products shall have current ICC ES Evaluation report conforming to current ICC ES Acceptance Criteria AC308.
  - c. Rod diameter and embedment length as indicated on Drawings.
  - d. Type Two Acceptable Products:
    - 1) HIT-RE 500-SD by Hilti Fastening Systems, Tulsa, OK [www.us.hilti.com](http://www.us.hilti.com).
    - 2) Equal as approved by Architect before installation. See Section 01 6200.
5. Drilled-In Mechanical Anchors (Expansion Bolts):
  - a. Provide anchors with length identification markings conforming to ICC ES AC 193.
  - b. Products shall have current ICC ES Evaluation report conforming to current ICC ES Acceptance Criteria AC193.
  - c. Type Two Acceptable Products:
    - 1) Kwik Bolt TZ, HSL-3, HAD by Hilti Fastening Systems, Tulsa, OK [www.us.hilti.com](http://www.us.hilti.com).
    - 2) Equal as approved by Architect before installation. See Section 01 6200.
6. Screw Anchors:
  - a. Type Two Acceptable Products:
    - 1) HUS-H Screw Anchor by Hilti, Tulsa, OK [www.us.hilti.com](http://www.us.hilti.com).
    - 2) Titen HD by Simpson Strong Tie Co, Dublin, CA [www.strongtie.com](http://www.strongtie.com).
    - 3) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.

## EXECUTION

### 2.2 EXAMINATION

- A. Verification of Conditions:
  1. Embedded Items:
    - a. Identify position of reinforcing steel and other embedded items before drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Take precautions as necessary to avoid damaging pre-stressing tendons, electrical and telecommunications conduit, and gas lines.
    - b. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling.
  2. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

### 2.3 INSTALLATION

- A. Drilled-In Anchors:
  1. General:
    - a. Drill holes with rotary impact hammer drills using carbide-tipped bits or core drills using diamond core bits.
    - b. Unless otherwise shown on the Drawings, drill holes perpendicular to concrete surface.
    - c. Where anchors are to be installed in cored holes, use core bits with matched tolerances specified by Manufacturer. Cores holes may only be used if acceptable to Manufacturer.
    - d. Perform anchor installation in accordance with Manufacturer's published instructions.
  2. Drilled-in Mechanical Anchors:

- a. Protect threads from damage during anchor installation.
  - b. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10 percent of specified torque, 100 percent of specified torque shall be reached within 7 or fewer complete turns of nut. If specified torque is not achieved within required number of turns, remove and replace anchor, unless otherwise directed by Architect.
3. Drilled-in Adhesive Anchors:
- a. Clean holes in accordance with Manufacturer's published instructions before installation of adhesive. Follow Manufacturer's recommendations to ensure proper mixing of adhesive components.
  - b. Inject adhesive into holes proceeding from bottom of hole and progressing toward surface so as to avoid introduction of air pockets into adhesive. Inject sufficient adhesive into hole to ensure that annular gap is filled to surface.
  - c. Remove excess adhesive from surface.
  - d. Shim anchors with suitable device to center anchor in hole. Do not disturb or load anchors before Manufacturer's specified cure time has elapsed.
  - e. Observe Manufacturer's recommendations with respect to installation temperatures for adhesive anchors.

## 2.4 FIELD QUALITY CONTROL

- A. Special inspection shall be performed according to Manufacturer's submitted ICC ES Evaluation Report. Notify Architect one week before installing anchors so testing may be scheduled.
- B. Testing: [10] [25] \_\_\_\_\_ percent of each type and size of drilled-in anchor shall be proof loaded by Owner's independent testing laboratory. Adhesive anchors will not be torque tested unless otherwise directed by Architect. If more than 10 percent of tested anchors fail to achieve specified torque or proof load within limits defined on Drawings, all anchors of same diameter and type as failed anchors shall be tested at the Contractors expense, unless otherwise instructed by Architect.
1. Torque will be applied with calibrated torque wrench.
  2. Proof loads will be applied with calibrated hydraulic ram. Displacement of adhesive anchors at proof load shall not exceed  $D/10$ , where D is nominal anchor diameter.
- C. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength, non-shrink, non-metallic grout acceptable to Architect. Anchors that fail to meet proof load or installation torque requirements will be regarded as malfunctioning.

**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 318-05.
  - 2. ASTM International:
    - a. ASTM A 615-05a, 'Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.'

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Shop Drawings: Reinforcing placement drawings.
- B. Informational Submittals:
  - 1. Certificates: Mill certificates for mill tests for reinforcing in accordance with ASTM A 615.

**1.4 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. Field bent dowels may be 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 ACCESSORIES**

- 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 on sub-grade, or other feature to prevent chair from being pushed into sub-grade or damaging the vapor retarder under slabs on grade.
- c. Equals as approved by Architect before installation. See Section 01 6200.

## 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 (1 350 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 as described in Contract Documents.
  - 2. Furnish and install 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 and equipment pads as described in Contract Documents.
  - 4. Furnish and install sealants and curing compounds as described in Contract Documents.
- B. Products Installed But Not Furnished Under This Section:
  - 1. Flagpole base and foundation sleeve.
- C. Related Requirements:
  - 1. Section 03 3111: Concrete mix information and use admixtures.
  - 2. Section 03 3517: Concrete sealer-hardener-waterproofer application.
  - 3. Section 03 3923: Membrane Concrete Curing application.
  - 4. Section 07 9213: Quality of Sealants.
  - 5. Section 31 2323: Compaction procedures and tolerances.
  - 6. Section 32 8423: Sleeves for underground irrigation system.
  - 7. Section 10 7516: Furnishing of flagpole base and foundation sleeve.

**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.
  - 3. In addition to agenda items specified in Section 01 3100, review following:
    - a. Approved mix design and use of admixtures.
    - b. Installation scheduling, coordination, and placement of concrete.
    - c. Placement, finishing, and curing of concrete including cold and hot weather requirements.

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Samples of detectable warning panels.
- B. Informational Submittals:
  - 1. Manufacturer's Instructions for detectable warning panels:
    - a. Provide printed product data.
    - b. Installation instructions.
    - c. Cleaning and maintenance instructions.

**1.4 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).'

**PART 2 - PRODUCTS**

**2.1 SYSTEM**

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

**2.2 ACCESSORIES**

- 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:
  - 2.

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](http://www.aknightcompany.com).
      - 2) Sealtight by W R Meadows Inc, Hampshire, IL [www.wrmeadows.com](http://www.wrmeadows.com).
      - 3) Equal as approved by Architect before installation. See Section 01 6200.
  - 3. Recycled Vinyl:
    - a. Light gray color.
    - b. Type Two Acceptable Products:
      - 1) Proflex by Oscoda Plastics Inc, Oscoda, MI [www.oscodaplastics.com](http://www.oscodaplastics.com).
      - 2) Equal as approved by Architect before installation. See Section 01 6200.
- D. Detectable Warnings Panels:
  - a. ADA compliant.
  - b. Cementitious concrete panel.
  - c. Colors: Select color from Manufacturer's available colors.
  - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
    - 1) TekWay Dome Tiles by StrongGo Industries, Tucson, AZ [www.stronggo.com](http://www.stronggo.com).
    - 2) CASTinTACT by Masons Supply Co., Portland OR [www.masco.net/castintactweb](http://www.masco.net/castintactweb).

**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: Except under mow strips, place **4 inches (100 mm)** minimum of granular base, level, and compact as specified in Section 31 2324.
- C. Sidewalks, Exterior Stairs, And Landings:
  - 1. Slope sidewalks with cross slope of **1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm)** in direction of intended drainage.
  - 2. Slope sidewalks away from building one percent minimum.
  - 3. Do not dust with cement.
- D. Mow Strips:
  - 1. Granular base not necessary under mow strips.
  - 2. Form and cast mow strips in place.
  - 3. Set top of mow strip **1-1/2 inches (38 mm)** above finish grade.
  - 4. Compact topsoil underneath mow strip to density of undisturbed earth.
- E. 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.
    - d. Spacing On Center:

Sidewalks and Curbs	<b>50 feet</b>	<b>15 000 mm</b>
Mow Strips	<b>100 feet</b>	<b>30 000 mm</b>
Flat Drainage Structures	<b>50 feet</b>	<b>15 000 mm</b>
Retaining Walls w/guardrails	<b>36 feet</b>	<b>10 000 mm</b>
Retaining Walls w/chain link fencing	<b>50 feet</b>	<b>15 000 mm</b>

- 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**.
  - b. Spacing On Center:

Sidewalks	<b>5 feet</b>	<b>1 500 mm</b>
Curbs	<b>10 feet</b>	<b>3 000 mm</b>
Mow Strips	<b>5 feet</b>	<b>1 500 mm</b>
Flat Drainage Structures	<b>10 feet</b>	<b>3 000 mm</b>
Retaining Walls w/guardrails	<b>Align with posts</b>	
Retaining Walls w/chain link fencing	<b>Align with posts</b>	

- F. Finish:
  - 1. Flatwork:
    - a. Curb, Gutter, Sidewalks, Mow Strips, Flat Drainage Structures, Stairs, And Miscellaneous:
      - 1) Broom finish.
      - 2) Round edges including edges formed by expansion joints.
      - 3) Remove edger marks.
  - 2. Vertical Surfaces:
    - a. Retaining Walls, Exposed Foundations, etc:
      - 1) Finish provided by form release / finish agent specified in 03 1113.
      - 2) Repair of Unacceptable Concrete.
        - 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 matching surrounding undamaged area.
        - c) Light Pole And Flagpole Bases: Exposed portion to have rubbed finish.

### 3.3 APPLICATION

- A. Interface With Other Work:
  - 1. Sealer-Hardener-Waterproofer: Apply product specified in Section 03 3517 on exterior concrete walking surfaces for safety purposes.
  - 2. Membrane Curing Compound: Apply product specified in Section 03 3923 to curbs, gutters, sidewalks, flat drainage structures, stairs, landings, and pads approximately 1/2 hour after application of sealer-hardener-waterproofer.

### 3.4 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. Section 31 2324: Granular base course under slabs.
  - 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 595-08, 'Standard Specification for Blended Hydraulic Cements.'
    - g. ASTM C 618-05, 'Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.'
    - h. ASTM C 989, 'Standard Specification for Ground Granulated Blast – Furnace Slag for use in Concrete and Mortars.'
    - i. ASTM C 1116, 'Standard Specification for Fiber Reinforced Concrete and Shotcrete.'
    - j. ASTM C 1157-08, 'Standard Performance Specification for Hydraulic Cement.'

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference:
  - 1. Schedule pre-installation conference prior to placing of footings, installation of foundation forms and reinforcing steel, and installation of anchors, dowels, inserts, and block outs in foundation walls and slabs.
  - 2. In addition to agenda items specified in Section 01 3100, review following:
    - a. Approved mix design and use of admixtures.
    - b. Installation scheduling, coordination, and placement of items installed in and under floor slab.
    - c. Placement, finishing, and curing of concrete including cold and hot weather requirements.
    - d. Concrete slab tolerances and corrective measures if tolerances not met.
  - 3. Require the ready mix supplier to work with the HVSMF supplier regarding mix designs and batching procedures and with the pumping subcontractor if the mix is pumped.
    - a. The flat work subcontractor (placing and finishing), the pumper subcontractor, the superintendant are to be at the Pre-Installation Conference to discuss the concrete mix

design, the placing of the concrete, the finishing of the concrete and the curing of the concrete.

- b. Review Special Procedure Submittal.

#### 1.4 SUBMITTALS

##### A. 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 A:

- (1) 3000 psi (20.7 Mpa) (minimum) at 28 days.
- (2) Water / Cement Ratio: 0.47 to 0.53 by weight.

##### b) Mix Type B:

- (1) 3500 psi (24 Mpa) (minimum) at 28 days.
- (2) Water / Cement Ratio: 0.47 to 0.53 maximum by weight.

##### c) Mix Type C:

- (1) 4000 psi (27.6 Mpa) (minimum) at 28 days.
- (2) Water / Cement Ratio: 0.47 to 0.53 maximum by weight.

##### d) Mix Type D:

- (1) 4500 psi (31 MP)a (minimum) at 28 days.
- (2) Water / Cement Ratio: 0.45 maximum by weight.

##### e) Mix Type E:

- (1) 3000 psi (20.7 Mpa) (minimum) at 28 days.
- (2) Water / Cement Ratio: 0.47 to 0.53 maximum by weight.
- (3) Cementitious material per cubic yard of concrete: 540 lbs.
- (4) 7 1/2 lbs of Forta Ferro [2 1/4 inches (57 mm)] per cubic yard of concrete.
- (5) Use low dose of polycarboxylate superplasticizer admixture of about 22 ounces per cubic yard of concrete (4 ounces per 100 pounds of cement).

- f) Air Entrainment: 6 percent, plus or minus 1-1/2 percent for Exterior Concrete and foundation walls exposed to freeze thaw conditions.

- g) 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.
3. Special Procedure:
- a. High Volume Synthetic Macro Fiber Reinforcement:
    - 1) Construction guidelines by Manufacturer.

**PART 2 - PRODUCTS**

**2.1 SYSTEM**

- A. Manufacturers:
- 1. Manufacturer Contact List:
    - a. BASF Admixtures, Cleveland, OH [www.basf-admixtures.com](http://www.basf-admixtures.com).
    - b. Bonsal American, Charlotte, NC [www.bonsal.com](http://www.bonsal.com).
    - c. Dayton Superior Specialty Chemicals, Kansas City, KS [www.daytonsuperiorchemical.com](http://www.daytonsuperiorchemical.com).
    - d. Euclid Chemical Company, Cleveland, OH [www.euclidchemical.com](http://www.euclidchemical.com).
    - e. Fritz-Pak Concrete Admixtures, Dallas, TX [www.fritzpak.com](http://www.fritzpak.com).
    - f. Grace Construction Products, Cambridge, MA [www.graceconstruction.com](http://www.graceconstruction.com) and Grace Canada Inc, Ajax, ON (905) 683-8561.
    - g. L & M Construction Chemicals, Omaha, NE [www.lmcc.com](http://www.lmcc.com).
    - h. Larsen Weldcrete by Larsen Products Corp, Rockville, MD [www.larsenproducts.com](http://www.larsenproducts.com).
    - i. Sika Corporation, Lyndhurst, NJ [www.sikaconstruction.com](http://www.sikaconstruction.com) and Sika Canada, Pointe Claire, QC [www.sika.ca](http://www.sika.ca).
    - j. Sonneborn / BASF Building Systems, Shakopee, MN [www.chemrex.com](http://www.chemrex.com).
    - k. TAMMS Industries, Mentor, OH [www.tamms.com](http://www.tamms.com).
    - l. Unitex, Kansas City, MO [www.unitex-chemicals.com](http://www.unitex-chemicals.com).
    - m. U S Mix Products Co, Denver, CO [www.usspec.com](http://www.usspec.com).
    - n. W R Meadows, Hampshire, IL [www.wrmeadows.com](http://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.
      - 2) At 28 days: 100 percent minimum of 28 day strengths.
      - 3) At 28 days:
        - a) Mix Type A: 3000 psi (20.7 Mpa).
        - b) Mix Type B: 3500 psi (24 Mpa).
        - c) Mix Type C: 4000 psi (27.6 Mpa).
        - d) Mix Type D: 4500 psi (31 Mpa).
        - e) Mix Type E: 3000 psi (20.7 Mpa).
- C. Materials:

Portland Cement / Blended Hydraulic Cement Equivalencies		
ASTM C150 (Low Alkali)	ASTM C595	ASTM C1157
Type I / II	IP	GU

- 1. Hydraulic Cement: Meet requirements of ASTM C 150, Type I / II.
  - a. Meet requirements of ASTM C 595, Type I / II.
  - b. Meet requirements of ASTM C 1157, Type I / II.

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. See Section 01 6200.
- 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) Pozzolith 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. See Section 01 6200.
- 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) Pozzolith 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. See Section 01 6200.
- 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. See Section 01 6200.
- 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) Pozzolith NC 534 or 122HE or Pozzutec 20+
  - e) Daraset or Polarset by W R Grace.
  - f) Equal as approved by Architect before use. See Section 01 6200.

## 2.2 ACCESSORIES

- 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. See Section 01 6200.
- 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. See Section 01 6200.
- C. High Volume Synthetic Macro Fiber Reinforcement:
- 1. Interior concrete flatwork only.
  - 2. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
    - a. Forta Ferro by Forta Corp. Grove City, PA [www.fortacorp.com](http://www.fortacorp.com).
      - 1) Contact Information: Dan Biddle (724) 458-5221 (office) or (412) 979-9198 (cell) or [dbiddle@fortacorp.com](mailto:dbiddle@fortacorp.com).

## 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 sub-grades 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.
- 2. Local Flatness / Levelness of Interior Slabs:
  - a. Specified Overall Value of  $F_{F28} / F_{L20}$  and Minimum Local Value of  $F_{F20} / F_{L15}$  when tested in accordance with ASTM E 1155.
  - b. Table Four: Maximum Variation Tolerances.

Thickness, standard	plus 3/8 inch, minus 1/4 inch	plus 9 mm, 3 mm
Thickness, footings	minus 0 inch	minus 0 mm
Plan, 0 - 20 feet	1/2 inch	12 mm
Plan, 40 feet or greater	3/4 inch	19 mm
Plan, footings	plus 1/2 inch	plus 12 mm
Eccentricity, footings	2 inch max standard, 1/2 inch at masonry	50 mm max standard, 12 mm at masonry
Openings, size	minus 1/4 inch, plus One inch	minus 6 mm, plus 25 mm
Openings, location	plus / minus 1/2 inch at center	plus / minus 12 mm at center
Plumb	1/2 inch max	6 mm max
Consecutive Steps, treads	1/4 inch	6 mm
Consecutive Steps, risers	1/8 inch	13 mm
Flight of Stairs, treads	1/4 inch in total run	6 mm in total run
Flight of Stairs, risers	1/8 inch in total height	3 mm in total height

- 3. Remedy For Out-of-Tolerance Building Slabs:
  - a. Sections of slabs to be covered by carpet, which do not meet specified tolerances but are within 10 percent of specified tolerances, may be corrected by grinding or filling, at Owner's option. Remove and replace sections of slabs measuring outside specified correctable tolerances.
  - b. If floor leveling compounds or concrete patching compounds are required to bring floor into specified tolerances in carpeted areas, they will be provided by Owner in conjunction with carpet installation and back-charged to Contractor.

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. 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 [2 inches (50 mm) at 6 inches (150 mm) slabs].
- 3. Equipment Bases: Coordinate with appropriate Sections for locations and dimensions.
- 4. Joints:
  - a. Where possible, locate joints under partitions or where joints will cause least disruption to floor coverings.
  - b. Construction Joints: Locate where shown on Drawings to least impair strength of completed structure. Construction joints in foundation walls shall not occur within 6 feet (1 800 mm) of corner and be keyed.
- 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.
- 6. Anchor Bolts: Place anchor bolts not tied to reinforcing steel immediately following leveling of concrete. Reconsolidate concrete around bolt immediately after placing bolt. Do not disturb bolts during finishing process.
- 7. Substrate For Geocomposite Foundation Drainage System:
  - a. Concrete surfaces shall be of sound structural grade and have smooth finish free of fins, ridges, protrusions, rough spalled areas, loose aggregate, exposed coarse aggregate, voids or entrained air holes. Rough surfaces shall receive well-adhered parge coat.
  - b. Repair voids, rock pockets, and excessively rough surfaces with approved non-shrink grout or grind to match unrepaired areas.
  - c. Surfaces at cold joints shall be on the same plane.
- 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. Steel Trowel Finishes, Interior Flatwork:
    - a. Float and steel trowel interior slabs after concrete has set enough to avoid bringing water and fines to surface.
    - b. If power troweling is used, get approval of finish from Architect.
  - 3. 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.
  - 4. Rough: Top of slabs and stairs to receive setting bed for ceramic or paver tile.

- E. Curing:
  - 1. Interior Slabs:
    - a. Water cure as specified in Section 03 3913.
    - b. Membrane cure as specified in Section 03 3923.
  - 2. Concrete Paving: Membrane cure as specified in Section 03 3923.
  - 3. 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, foundation walls, 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.
  - 3. Section 03 3517: Concrete sealer-hardener-waterproofers application.
  - 4. Section 32 1313: Concrete paving.

**1.2 REFERENCES**

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

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data: Manufacturer's product data.
- B. Informational Submittals:
  - 1. Manufacturer Instructions: Printed installation instructions.

**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. See Section 01 6200 for definition of Classes.
      - 1) Vocomp 20 Cure and Seal by W. R. Meadows.
  - 3. Concrete Paving:
    - a. Class Two Quality Standard. See Section 01 6200 for definition of Classes.
      - 1) 1200 White by W. R. Meadows.
- B. Interior:
  - 1. Low VOC (less than 350 grams per liter), water-borne, membrane forming curing compound meeting requirements of ASTM C 309, Type 1D, Class B and containing no mineral spirits, naphtha, or other components detrimental to finish flooring installation.
  - 2. Category Four Approved Manufacturers. See Section 01 6200 for definition of Categories.

- a. Safe Cure & Seal (J-18) by Dayton Superior Specialty Chemicals, Kansas City, KS  
[www.daytonsuperiorchemical.com](http://www.daytonsuperiorchemical.com).
- b. Soncrete Kure-N-Seal W or WB by Sonneborn / BASF Building Systems, Shokopee, MN  
[www.chemrex.com](http://www.chemrex.com).

### **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.

#### **3.2 APPLICATION**

- A. Interface With Other Work:
  1. Apply concrete sealer-hardener-waterproofer approximately 1/2 hour before application of Membrane Concrete Curing.

**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 as described in Contract Documents.
    - a. For securing anchor bolts and hardware in concrete.
    - b. For securing anchor bolts and hardware in masonry.
    - c. For grout base for structural columns.
    - d. For grout base for exterior light poles
- B. Related Requirements:
1. Section 04 0516: Masonry grout.

**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 MANUFACTURERS**

- A. Type Two Acceptable Products:
1. Normal Construction Grout A by Bonsal American, Charlotte, NC [www.bonsal.com](http://www.bonsal.com).
  2. Advantage 1107 Grout by Dayton Superior Corporation, Oregon, IL [www.daytonsuperiorchemical.com](http://www.daytonsuperiorchemical.com).
  3. NS Grout by Euclid Chemical Co, Cleveland, OH [www.euclidchemical.com](http://www.euclidchemical.com).
  4. Construction Grout by Five Star Products Inc, Fairfield, CT [www.fivestarproducts.com](http://www.fivestarproducts.com).
  5. Duragrout by L&M Construction Chemicals Inc, Omaha, NE [www.lmcc.com](http://www.lmcc.com).
  6. Sonneborn / deGussa Building Systems, Shakopee, MN [www.chemrex.com](http://www.chemrex.com).
  7. Horn Grout by TAMMS Industries Inc, Kirkland IL [www.tamms.com](http://www.tamms.com).
  8. U S Spec MP Grout by U S Mix Products Co, Denver, CO [www.usspec.com](http://www.usspec.com).
  9. CG-86 Grout by W R Meadows, Hampshire, IL [www.wrmeadows.com](http://www.wrmeadows.com).
  10. Equal as approved by Architect before installation. See Section 01 6200.

**2.2 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 (41 Mpa)** minimum.

**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 1200 STRUCTURAL STEEL FRAMING  
05 1223 STRUCTURAL STEEL FOR BUILDINGS

**05 3000 METAL DECKING**

05 3123 STEEL ROOF DECKING

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 and galvanizing.
- B. Related Requirements:
  - 1. Sections under 09 9000 heading: Finish painting.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. ASTM International:
    - a. ASTM A 780-01, 'Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.'
    - b. ASTM B 695-04, 'Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.'

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Meet with Architect before commencing repair of galvanized surfaces to establish extent of repairs required and, if applicable, choice of methods to be used.

**1.4 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data: Product data and samples, if requested by Architect.

**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.
- C. Material For Repairs Of Galvanized Surfaces:
  - 1. Non-Structural, Non-Load-Bearing Items Not Exposed To Weather:
    - a. Zinc-Rich Paints:
      - 1) Zinc-Dust Content: Dried film shall contain 94 percent minimum of zinc-dust by weight.
      - 2) Type One Acceptable Manufacturers:

- a) Galvax by Alvin Products Inc, Everett, MA [www.alvinproducts.com](http://www.alvinproducts.com).
  - b) ZRC Galvilite by ZRC Worldwide, Marshfield, MA [www.zrcworldwide.com](http://www.zrcworldwide.com).
  - c) Equal as approved by Architect before bidding. See Section 01 6200.
2. Structural, Load-Bearing Items And Items Exposed To Weather:
- a. Zinc-Based Solders, Powder, Or Rod:
    - 1) Zinc-Cadmium solder with liquidus temperature range from 518 to 527 deg F 270 to 275 deg C, or
    - 2) Zinc-Tin-Lead alloy with liquidus temperature range from 446 to 500 deg F 30 to 260 deg C.
  - b. Sprayed Zinc: Wire, ribbon, or powdered zinc suitable for process.

## 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.
- C. Preparation Of Galvanized Surfaces:
1. Follow requirements of ASTM A 780 and following:
  2. For Repair Using Zinc-Rich Paints:
    - a. Blast clean surfaces to near-white metal, in accordance with SSPC-SP10 (1 to 2 mil anchor pattern), as minimum.
    - b. Where circumstances do not allow blast cleaning, power disk sand to bright metal finish.
    - c. Extend surface preparation into undamaged galvanized area.
    - d. Remove flux residue and weld spatter from welded areas.
  3. For Repair Using Zinc-Based Alloys:
    - a. Clean surface to be reconditioned using wire brush, light grinding action, or mild blasting.
    - b. Extend surface preparation into surrounding, undamaged galvanized areas.
    - c. Remove flux residue and weld spatter from welded areas.
    - d. Preheat cleaned area to at least 600 deg F 316 deg C.
      - 1) Do not overheat surface beyond 750 deg F 400 deg C or allow surrounding galvanized coatings to be burned.
      - 2) Wire brush surface during preheating.
  4. For Repair Using Sprayed Zinc (Metallizing):
    - a. Blast clean surfaces to near-white metal, in accordance with SSPC-SP5 as minimum.
    - b. Extend surface preparation into undamaged galvanized area.
    - c. Remove flux residue and weld spatter from welded areas.

### 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.
- B. Repairs To Galvanized Surfaces:
1. Non-Structural, Non-Load-Bearing Items Not Exposed To Weather:
    - a. Repair Using Zinc-Rich Paints: Spray- or brush-apply zinc-rich paint to prepared area. Apply paint in single application employing multiple spray passes to achieve dry film thickness of 2 mils.

2. Structural, Load-Bearing Items And Items Exposed To Weather:
  - a. Repair Using Zinc-Based Alloys:
    - 1) Rub cleaned, pre-heated areas with repair stick to deposit evenly distributed layer of zinc alloy. If powdered zinc alloys are used, sprinkle powder on surface and spread out with spatula or similar tool.
    - 2) Remove flux residue by rinsing with water or wiping with damp cloth.
  - b. Repair Using Sprayed Zinc (Metallizing): Apply 2 mil minimum coating by means of metal-spraying pistols fed with either zinc wire or zinc powder in accordance with requirements of ASTM B 695, Type I.
3. 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. Section 03 1511: Cast-in-place and drilled-in anchor bolts.
  - 2. Furnishing and installing of structural bolts specified under Section concerned.
  - 3. 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 -****2.1 MANUFACTURED UNITS**

- A. Materials:
  - 1. Bolts And Threaded Fasteners:
    - a. Anchor Rods For Steeple Base Connections: Conform to requirements of ASTM A 36.
    - b. 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.
- B. Minimum weld sizes, unless detailed otherwise.
  - 1. Weld pipe columns to base plates and top plates with 1/4 inch 6 mm fillet weld all around.
  - 2. Weld glu-lam connection side plates to base plates with 1/4 inch 6 mm fillet weld all along outside edges.
  - 3. Weld stiffeners to pipe columns with 1/4 inch 6 mm fillet weld all around.

**END OF SECTION**

**SECTION 05 1200****STRUCTURAL STEEL FRAMING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install structural steel framing as part of building structure as described in Contract Documents.
- B. Products Furnished But Not Installed Under This Section:
  - 1. Structural anchors, plates, channels, angles, etc, to be cast into concrete.
- C. Related Requirements:
  - 1. Section 03 3111: Installation of structural items to be cast into concrete.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. American Institute of Steel Construction / American National Standards Institute:
    - a. AISC / ANSI 341-2005, 'Seismic Provisions for Structural Steel Buildings.'
    - b. AISC / ANSI 360-2005, 'Specification for Structural Steel Buildings.'
  - 2. ASTM International:
    - 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.'
    - d. ASTM A 992-04a, 'Standard Specification for Structural Steel Shapes.'

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data: Submit product data and samples, if requested by Architect.
  - 2. Shop Drawings:
    - a. Shop drawings and calculations, prepared and stamped by structural engineer, shall include, but not be limited to, plans, elevations, and large scale details of typical sections, connections, joining, and accessories.
    - b. Show other fabricated work.

**PART 2 - PRODUCTS****2.1 COMPONENTS**

- A. Materials:
  - 1. Beams, Columns, Angles, Channels, and Miscellaneous steel parts of steel framing systems.
    - a. Meet requirements of ASTM A 36.
    - b. S, HP, C, or TEE shapes in horizontal or vertical application, together with angles, plates, etc, as shown on Drawings.
  - 2. Beams 'W' shapes: Meet requirements of ASTM A 992 without supplementary requirements.

3. Structural Pipe:
  - a. Meet requirements of ASTM A 53, Type E or S, Grade B.
    - 1) Weight Class, STD, Schedule 40.
    - 2) Weight Class, XS, Schedule 80.
  4. Structural Tubing: Meet requirements of ASTM A 500, Grade B.
- B. Fabrication:
  1. Requirements: Structural metal shall be product of domestic mill.
  2. AISC / ANSI 360 shall serve as minimum standard.
  3. Fabricate items to be embedded in concrete or masonry according to approved details of work to be connected.
- C. Finishes: Shop prime structural steel.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not begin structural steel framing erection until structural support components have been installed and are in suitable condition to receive framing.

#### **3.2 ERECTION**

- A. Interface With Other Work: Furnish items to be embedded in concrete or masonry to Division 03 or 04 respectively in time to be securely tied in place before placing concrete and grout.
- B. AISC's 'Specification for Structural Steel Buildings' March 2005 and 'Code of Standard Practice for Steel Buildings and Bridges' March 2005 shall serve as minimum standards. Erection includes setting, aligning, and bracing as necessary.
- C. Do not overload or exceed carrying capacity of any structural steel element during construction period.
- D. Bridging installation shall proceed concurrently with truss erection and be completed before trusses are subjected to construction loads. Do not remove bridging after construction is complete.
- E. Plates or Channels Embedded in Concrete: Tack weld bolts to plates or channels to prevent bolts from turning when nuts are tightened.
- F. Immediately after erection, clean completed field connections and damaged surfaces with solvents and hand or power tools. After cleaning, apply corrosion-resistant primer compatible with factory-applied primer.

**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. Miscellaneous structural steel.
  - 2. Structural pipe for bollards.
- B. Related Requirements:
  - 1. Section 03 3053: Installation of bollards.
  - 2. Sections under 04 2000 heading: Installation of lintels, channel frames, and miscellaneous structural steel.
  - 3. Section 05 0503: Quality of priming.
  - 4. Section 05 0523: Quality of welding.
  - 5. Section 06 1100: Installation of miscellaneous structural steel.

**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. Lintels, Glue-Laminated Structural Unit Connections, Under-Platform Door Frames, Channel Frames, And Miscellaneous Structural Steel: Meet requirements of ASTM A 36.
  - 2. Structural Pipe.
    - a. Meet requirements of ASTM A 53, Type E or S, Grade B.
      - 1) Weight Class, STD, Schedule 40.
      - 2) Weight Class, XS, Schedule 80.
      - 3) Weight Class, DXS.
  - 3. Structural Tubing: Meet requirements of ASTM A 500, Grade B.
- B. Fabrication:
  - 1. After fabrication and before shop priming, hot-dip or mechanically galvanize lintels to be installed in exterior walls, bollards, satellite dish base, and channel frames.
  - 2. 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**

**SECTION 05 3123****STEEL ROOF DECKING****PART 1 - GENERAL****1.1 SUMMARY**

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

**1.2 REFERENCES**

- A. Reference Standards:
1. ASTM International:
    - a. ASTM A 653-02a, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.'
  2. American Welding Society / American National Standard Institute:
    - a. AWS / ANSI D1.3-1998, 'Structural Welding Code - Sheet Steel.'
  3. Steel Deck Institute:
    - a. SDI 29, 'Steel Deck Institute Design Manual for Composite Decks, Form Decks, Roof Decks, and Cellular Metal Floor Deck with Electrical Distribution.'

**1.3 SUBMITTALS**

- A. Action Submittals:
1. Product Data: Provide Manufacturer's cut sheets including, but not limited to, dimensions of individual components, profiles, and finishes.
  2. Shop Drawings: Show location of metal deck panels, anchorage details, and other information required for thorough review.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. General: Protect metal deck panels from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Storage:
1. If ground storage is required, store bundles of metal deck panels off ground with one end elevated to provide drainage.
  2. Protect bundles from condensation with ventilated waterproof covering.
  3. Stack bundles to prevent material damage.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Roof Deck:
1. 20 ga 0.879 mm composite intermediate rib deck formed from flat rolled carbon steel sheets meeting requirements of ASTM A 653, Grade A, zinc coated.
  2. Product Standard: 1-1/2 inch 38 mm, USD, B-Deck.
  3. Type One Acceptable Manufacturers:

- a. Any current member of the Steel Deck Institute.
- b. Equal as approved by Architect before bidding. See Section 01 6200.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work of this Section.

#### **3.2 PREPARATION**

- A. Locate bundles to prevent overloading of support members.

#### **3.3 INSTALLATION**

- A. Install in accordance with American Iron & Steel Institute's 'Specification for the Design of Cold-Formed Steel Structural Members,' Section 4.2.1., as shown on placement drawings, and as specified.
- B. Each deck piece shall span across minimum of two spans.
- C. Place deck panels on structural supports and adjust to final position with ends aligned. Attach firmly to supports immediately after placement.
- D. Cut and neatly fit deck units and accessories around openings and other work projecting through or adjacent to decking.
- E. Do not cut unscheduled openings through deck without approval of Architect. Reinforce openings as shown on Drawings or as directed by Architect.
- F. Install deck ends over supports with minimum end bearing **1-1/2 inches 38 mm**.

**END OF SECTION**

**DIVISION 07: THERMAL AND MOISTURE PROTECTION**

**07 6000 FLASHING AND SHEET METAL**

07 6100 SHEET METAL ROOFING (07610)

**07 7000 ROOF AND WALL SPECIALTIES AND ACCESSORIES**

07 7123 MANUFACTURED GUTTERS AND DOWNSPOUTS (07629)

**07 9000 JOINT PROTECTION**

07 9213 ELASTOMERIC JOINT SEALANTS

END OF TABLE OF CONTENTS

**SECTION 07 6100****SHEET METAL ROOFING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install metal roofing system as described in Contract Documents.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Schedule pre-installation conference after installation of roof sheathing but before application of roofing system.

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data: Manufacturer's literature.
  - 2. Shop Drawings: Show all aspects of installation and accessories.
- B. Closeout Submittals:
  - 1. Warranty Documentation: Include final, executed copies of warranties in Operations And maintenance Manual specified in Section 01 7800.

**1.4 WARRANTY**

- A. 20-year minimum guarantee on weather tightness of roof system.
- B. Manufacturer's written 20-year guarantee for finishes.

**PART 2 - PRODUCTS****2.1 SYSTEM**

- A. Manufacturers:
  - 1. Type One Quality / Style Standard: <Insert Product> by <Insert Manufacturer>.
  - 2. Acceptable Manufacturers:
    - a. AEP-Span, Dallas, TX [www.aep-span.com](http://www.aep-span.com).
    - b. ATAS International, San Diego, CA [www.atas.com](http://www.atas.com).
    - c. Berridge Manufacturing Company, Houston, TX [www.berridge.com](http://www.berridge.com).
    - d. CMG – Coated Metals Group, Denver, CO [www.cmgmetals.com](http://www.cmgmetals.com).
    - e. Firestone Metal Products, Anoka, MN [www.unaclad.com](http://www.unaclad.com).
    - f. Englert Inc, Perth Amboy, NJ [www.englertinc.com](http://www.englertinc.com).
    - g. Fabral, Lancaster, PA [www.fabral.com](http://www.fabral.com).
    - h. MBCI, Houston, TX [www.mbcicom.com](http://www.mbcicom.com).
    - i. Merchant & Evans, Burlington, NJ [www.ziprib.com](http://www.ziprib.com).
    - j. Metal Sales Manufacturing Corporation, Sellersburg, IN [www.mtlsales.com](http://www.mtlsales.com).
    - k. MeTechno Morin Corporation, Bristol, CT [www.morincorp.com](http://www.morincorp.com).
    - l. Petersen Aluminum Corporation, Elk Grove Village, IL [www.pac-clad.com](http://www.pac-clad.com).

3. Other systems may be approved providing Architect is provided with complete specifications and details, tailored to job conditions, 10 days minimum before bid opening and system is approved on an Addendum. See Section 01 6200.
- B. Performance:
  1. Design Criteria: Roof construction shall carry UL Construction Uplift Rating of at least Class 90.
- C. Roofing Panels:
  1. Metal shall be galvanized 24 ga 0.635 mm steel minimum. Accessories to include valleys, copings, scuppers, downspouts, and edge flashings.
- D. Finishes:
  1. Face coating polyvinylidene Fluoride (PVF<sub>2</sub>) Resin-base finish (Kynar 500 or Hylar 5000) for coil coating components containing 70 percent minimum PVF<sub>2</sub> in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal.
  2. Reverse side coating thermo-cured system consisting of corrosion inhibiting epoxy primer applied over properly pre-treated metal.
  3. Color as selected by Architect from Manufacturer's standard colors.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install roofing, valleys, and coping as shown in Manufacturer's details and specifications modified for this Project. Fasteners shall be concealed.

**END OF SECTION**

**SECTION 07 7123****MANUFACTURED GUTTERS AND DOWNSPOUTS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install gutters and downspouts as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 07 9213: Quality of sealants for joints.

**1.2 REFERENCES**

- A. Reference Standard:
  - 1. Sheet Metal & Air Conditioning Contractors National Association Inc:
    - a. SMACNA Architectural Sheet Metal Manual, 5th edition 1993.

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Shop Drawings: Show gutter cross-section, mounting method, gauge of metal, expansion joint design and locations, and downspout locations minimum.

**PART 2 - PRODUCTS****2.1 ASSEMBLIES**

- A. Manufacturers:
  - 1. Type Two Acceptable Manufacturers of Metal:
    - a. CMG – Coated Metals Group, Denver, CO [www.cmgmetals.com](http://www.cmgmetals.com).
    - b. Englert Inc, Perth Amboy, NJ [www.englertinc.com](http://www.englertinc.com).
    - c. Fabral, Jackson, GA [www.fabral.com](http://www.fabral.com).
    - d. Firestone Metal Products, Anoka, MN [www.unaclad.com](http://www.unaclad.com).
    - e. MBCI, Houston, TX [www.mbc.com](http://www.mbc.com).
    - f. Metal Sales Manufacturing Corp, Sellersburg, IN [www.mtlsales.com](http://www.mtlsales.com).
    - g. Petersen Aluminum Corp, Elk Grove, IL [www.pac-clad.com](http://www.pac-clad.com).
    - h. Reynolds Metals Company, Richmond, VA [www.rmc.com](http://www.rmc.com).
    - i. Ryerson, Chicago, IL [www.ryerson.com](http://www.ryerson.com).
    - j. Equal as approved by Architect before installation. See Section 01 6200.
- B. Materials
  - 1. Steel:
    - a. Downspouts: Rectangular, 26 ga 0.478 mm galvanized steel including necessary elbows.
    - b. Gutters: 24 ga 0.635 mm galvanized steel.
    - c. Brackets: 22 ga 0.792 mm galvanized steel or 26 ga 0.478 mm double-hemmed minimum.
  - 2. Aluminum:
    - a. Downspouts: Rectangular 0.032 inch 0.813 mm minimum aluminum including necessary elbows.
    - b. Gutters: 0.050 inch 0.127 mm minimum aluminum.

- c. Brackets: 0.060 inch 0.152 mm minimum aluminum.
  - 3. Screws, Bolts, Nails, And Accessory Fasteners: Non-corrosive and of strength and type consistent with function.
  - 4. Downspouts, gutters, brackets, fasteners, and accessories shall be compatible material.
- C. Fabrication:
- 1. Fabricate in accordance with SMACNA Manual recommendations, where applicable.
  - 2. Cross-sectional configuration of gutter shall be Style A, Page 1.11 of SMACNA Manual.
  - 3. Form accurately to details.
  - 4. Profiles, bends, and intersections shall be even and true to line.
- D. Finishes:
- 1. Metal exposed to view shall have face coating of polyvinylidene Fluoride (PVF<sub>2</sub>) Resin-base finish (Kynar 500 or Hylar 5000) containing 70 percent minimum PVF<sub>2</sub> in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal. Reverse side coating shall be thermo-cured system consisting of corrosion inhibiting epoxy primer applied over properly pre-treated metal.
  - 2. Color as selected by Architect from Manufacturer's standard colors.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Before starting work, verify governing dimensions at building. Inspect for conditions that would prevent installation of specified system. Do not install over improper conditions.

### 3.2 INSTALLATION

- A. Insulate work from fascia as necessary to prevent electrolytic action.
- B. Allow no more than 40 feet between downspouts. Lap joints in downspouts 1-1/2 inches 38 mm minimum in direction of water flow.
- C. Furnish and install outlet tubes and gutter ends where required. Furnish and install expansion joints in runs exceeding 50 feet 15 meters and in runs that are restrained at both ends. Lap other joints in gutter one inch minimum, apply sealant in lap, and rivet 2 inches 50 mm on center maximum.

### 3.3 FIELD QUALITY CONTROL

- A. Field Tests: At completion of this work, block downspouts and flood gutters. Notify Architect two working days before testing. Repair leaks and adjust for proper drainage.

### 3.4 CLEANING

- A. Leave metals clean and free of defects, stains, and damaged finish.

**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.
  - 2. Section 07 2419: Sealants for EIF Systems.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. ASTM International:
    - a. ASTM C 920-08, 'Standard Specification for Elastomeric Joint Sealants.'

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data:
    - a. Manufacturer's literature and installation recommendations for each Product.
    - b. Schedule showing joints requiring sealants. Show also backing and primer to be used.
- B. Informational Submittals:
  - 1. Manufacturer Report: Certificate from Manufacturer indicating date of manufacture.

**1.4 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 List:
    - a. Dow Corning Corp, Midland, MI [www.dowcorning.com](http://www.dowcorning.com).
    - b. GE Sealants & Adhesives, Huntersville, NC [www.gesealants.com](http://www.gesealants.com) or G E Silicone Canada, Mississauga, ON (905) 858-6744 or (800) 668-4644.

- c. Laticrete International Inc, Bethany, CT [www.laticrete.com](http://www.laticrete.com).
  - d. Sherwin-Williams, Cleveland, OH [www.sherwin-williams.com](http://www.sherwin-williams.com).
  - e. Sika Corporation, Lyndhurst, NJ [www.sikaconstruction.com](http://www.sikaconstruction.com) or Sika Canada Inc, Pointe Claire, QC [www.sika.ca](http://www.sika.ca).
  - f. Tremco, Beachwood, OH [www.tremcosealants.com](http://www.tremcosealants.com) or Tremco Ltd, Toronto, ON (800) 363-3213.
- B. Materials:
1. Sealants provided shall meet Manufacturer's shelf-life requirements.
  2. Sealants At Exterior Concrete:
    - a. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
      - 1) Joints between building foundations and exterior site concrete:
        - a) Dow Corning:
          - (1) Primer: 1200 Prime Coat.
          - (2) Sealant: 790 Silicone Building Sealant.
        - b) GE Sealants & Adhesives:
          - (1) Primer: SS4044 Primer.
          - (2) Sealant: Silpruf SCS 2000 Silicone Sealant.
      - 2) Expansion joints in retaining walls:
        - a) Dow Corning:
          - (1) Primer: 1200 Prime Coat.
          - (2) Sealant: 790 Silicone Building Sealant
        - b) GE Sealants & Adhesives:
          - (1) Primer: SS4044 Primer.
          - (2) Sealant: Silpruf SCS 2000 Silicone Sealant.
      - 3) Expansion joints in Portland cement concrete driveways and parking lots:
        - a) Dow Corning:
        - b) 888 Silicone Joint Sealant. 890 SL Self-Leveling Silicone Joint Sealant may be used on non-sloping areas.
    3. 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. Caulk 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 07 9213: Quality of Elastomeric Joint Sealants.
  3. 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. MPI(r), Mar 2001, 'Maintenance Repainting 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 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conferences:
1. Participate in pre-installation conference specified in Section 09 2900 to review finish requirements of gypsum wallboard.
  2. Schedule painting pre-installation conference after delivery of paint but before or at same time as application of field samples.

### 1.4 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 specified in Section 01 7800:
    - a. Manufacturer's cut sheet for each component of each system.
    - b. Schedule showing rooms and surfaces where each system was used.
- 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.

### 1.5 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.

## 1.6 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.

## 1.7 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:
    - a. Color Levels:
      - 1) Color Level II:
        - a) Number and placement of interior and exterior paint colors and gloss levels shall be as defined by Color Level II from MPI Manual, PDCA P3-93 as modified in following paragraph.
        - b) No more than one paint color or gloss level will be selected for same substrate within designated interior rooms or exterior areas.
      - 2) Color Level III:
        - a) Number and placement of interior and exterior paint colors and gloss levels shall be Color Level III from MPI Manual, PDCA P3-93 as modified in following paragraph.
        - b) Several paint colors or gloss levels will be selected for same substrate within designated interior rooms or exterior areas.
- 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 APPROVED APPLICATORS**

- A. Applicator shall have experience in application of specified products for five years minimum and be acceptable to Architect and Paint Manufacturer.

**3.2 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.

**3.3 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. Keep cones of ceiling speakers completely free of paint. In all cases where painting of metal speaker grilles is required, paint without grilles mounted to speakers and without grilles on ceiling. On existing work where ceiling is to be painted, speakers and grilles are already installed, and ceiling color is not being changed, mask off metal grilles installed on ceiling speakers. If ceiling color is being changed, remove metal grilles and paint, and mask off ceiling speakers.
- 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. Fill minor holes and cracks in wood surfaces to receive paint or stain.
  3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
  4. 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.
  5. Sand woodwork smooth in direction of grain leaving no sanding marks. Clean surfaces before proceeding with stain or first coat application.

**3.4 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. Apply sealant in gaps 3/16 inch and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9213.
- 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.

### **3.5 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.

### **3.6 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.

**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 ungalvanized iron and steel surfaces as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 09 9001: Common Painting Requirements

**PART 2 - PRODUCTS****2.1 SYSTEM**

- A. Manufacturers:
  - 1. Category Four Approved Products and Manufacturers. See Section 01 6200 for definitions of Categories.
    - 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. New Surfaces: Use MPI(a) EXT 5.1M Waterborne Light Industrial Coating system .
  - 2. Previously Finished Surfaces: Use MPI(r) REX 5.1K Waterborne Light Industrial Coating.
- 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. New Surfaces: 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.
- C. Existing Painted Surfaces:

1. Remove deteriorated and chalked existing paint and rust down to sound substrate by scraping or power tools.
2. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying primer coat.
3. Spot prime bare metal surfaces followed by a prime coat over entire surface to be painted.
4. Lightly sand entire surface.
5. Clean surface as recommended by Paint Manufacturer.
6. Apply specified finish coats.

**END OF SECTION**

**DIVISION 31: EARTHWORK**

**31 0000 EARTHWORK**

31 0501 COMMON EARTHWORK REQUIREMENTS

**31 1000 SITE CLEARING**

31 1100 CLEARING AND GRUBBING  
31 1413 TOPSOIL STRIPPING AND STOCKPILING

**31 2000 EARTH MOVING**

31 2213 ROUGH GRADING  
31 2216 FINE GRADING  
31 2316 EXCAVATION  
31 2323 FILL  
31 2324 GRANULAR BASE

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.
  - 3. Existing Plants And Features: Do not damage tops, trunks, and roots of existing trees and shrubs on site that are intended to remain. Do not use heavy equipment within branch spread. Interfering branches may be removed only with permission of Architect. Do not damage other plants and features that are to remain.
- 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 1100****CLEARING AND GRUBBING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Perform clearing and grubbing as necessary to prepare site for rough grading and structure excavation as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 31 0501: Common Earthwork Requirements.

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

- A. Tree And Brush Removal:
  - 1. Cut off trees, shrubs, brush, and vegetative growth **12 inches (300 mm)** maximum above ground.
  - 2. Do not pull up or rip out roots of trees and shrubs that are to remain. If excavation through roots is required, excavate by hand and cut roots with sharp axe. Make clean, smooth, sloping cuts.
  - 3. Cut roots **6 inches (150 mm)** or larger in diameter only with Architect's written permission.
- B. Grubbing:
  - 1. Grub out stumps and roots **12 inches (300 mm)** minimum below original ground surface, except as follows:
    - a. Under buildings, remove roots one inch and larger entirely.
    - b. Entirely remove roots of plants that normally sprout from roots, as identified by Architect.

**3.2 CLEANING**

- A. Remove from site trees, shrubs, uprooted stumps, vegetative layer, and surface debris and dispose of legally.
- B. Do not bury cuttings, stumps, roots, and other vegetative matter or burnt waste material on site.

**END OF SECTION**

**SECTION 31 1413**

**TOPSOIL STRIPPING AND STOCKPILING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Strip and stockpile acceptable topsoil as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 31 0501: Common Earthwork Requirements.
  - 2. Section 32 9113: Finish grading of existing topsoil stored on site and addition of imported topsoil.

**1.2 REFERENCES**

- A. Definitions: Existing topsoil is defined as total amount of soil stripped and stored for reuse, less vegetation layer stripped and disposed of as specified in Paragraphs below.

**PART 2 - PRODUCTS: Not Used**

**PART 3 - EXECUTION**

**3.1 PERFORMANCE**

- A. Strip existing vegetation layer **2 inches (50 mm)** deep minimum from areas of site to receive buildings, landscaping, and paving and remove from site before stripping topsoil for storage and reuse.
- B. After stripping vegetation layer, strip existing topsoil additional **6 inches (150 mm)** deep minimum from areas of site to receive buildings and paving and store on site for later use.
  - 1. Existing topsoil is property of Contractor with restriction that topsoil is to be used first for Project landscape topsoil requirements and second for non-structural fill and backfill.
  - 2. After Project fill, backfill, and landscape topsoil requirements are satisfied, remove excess existing topsoil from site. Do not remove existing topsoil from site without Architect's written approval.

**END OF SECTION**

**SECTION 31 2213****ROUGH GRADING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Perform rough grading work required to prepare site for construction as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 31 0501: Common Earthwork Requirements

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference:
  - 1. Schedule conference after completion of site clearing but before beginning grading work.
  - 2. Identify benchmark to be used in establishing grades and review Contract Document requirements for grades, fill materials, and topsoil.
  - 3. Examine site to pre-plan procedures for making cuts, placing fills, and other necessary work.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Materials used for fill shall be as specified for backfill in Section 31 2323.

**PART 3 - EXECUTION****3.1 PREPARATION**

- A. Before making cuts, remove topsoil over areas to be cut and filled that was not previously removed by stripping specified in Section 31 1413. Stockpile this additional topsoil with previously stripped topsoil.

**3.2 PERFORMANCE**

- A. Tolerances: Maximum variation from required grades shall be **1/10 of one foot (28 mm)**.
- B. When existing grade around existing plants to remain is higher than new finish grade, perform regrading by hand. Do not expose or damage shrub or tree roots.
- C. Compact fills as specified in Section 31 2323.
- D. If soft spots, water, or other unusual and unforeseen conditions affecting grading requirements are encountered, stop work and notify Architect.

**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 and for landscape finish grading and soil preparation as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 31 0501: Common Site Construction Requirements.
  - 2. Section 31 1413: Stripping and storing of existing topsoil.
  - 3. Section 32 1216: Finish grading for asphalt paving.
  - 4. Section 32 9113: Soil preparation for landscaping.
  - 5. Section 32 9120: Topsoil Placement and grading

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 31 2213.

**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)**.
  - 2. To allow for final finish grades of parking lot and planting areas, fine grade elevations before placing topsoil are:
    - a. Sod Areas: **7 inches (175 mm)** below top of walk or curb.

- b. Seeded Areas And Ground Cover Areas: 6 inches (150 mm) below top of walk or curb.
  - c. Tree And Shrub Areas: 4 inches (100 mm) below top of walk or curb. No topsoil as defined in Section 32 9120 required.
- C. Do not expose or damage existing shrub or tree roots.
- D. Redistribute approved existing topsoil stored on site as a result of work of Section 31 1413. Remove organic material, rocks and clods greater than 1-1/2 inch (38 mm) in any dimension, and other objectionable materials.
- E. Slope grade away from building for 12 feet (3600 mm) minimum from walls at slope of 1/2 inch in 12 inches (13 mm in 300 mm) minimum unless otherwise noted. 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 inside and outside of building required for electrical and mechanical work is responsibility of respective Section doing work unless arranged differently by Contractor.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 31 2213.

**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 are encountered, contact Architect before proceeding.

**3.3 PERFORMANCE**

- A. Excavation:
  - 1. 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.
  - 2. 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.
3. 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 as described in Contract Documents, except as specified below.
  - 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 inside and 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.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 31 2213.
- B. Sequencing:
  - 1. Do not backfill against bituminous dampproofing for 24 hours after application of dampproofing.
  - 2. Before backfilling, show utility and service lines being covered on record set of Drawings. Do not backfill until utilities involved have been tested and approved by Architect and until instructed by Architect.

## 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 Building Footprint And 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.
    - b. Under Landscaped Areas:
      - 1) Fill more than **36 inches (900 mm)** below finish grade 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.
      - 2) Fill less than **36 inches (900 mm)** below finish grade shall comply with soil classification groups SW, SP, SM, or SC. Fill may not contain stones larger than **1-1/2 inches (38 mm)** in any direction and 90 percent minimum of fill shall be smaller than **3/8 inch (4.7 mm)** in any direction.
- C. Excavatable Slurry Fill / Backfill:
1. Contain maximum of **94 lbs of cement per yard (56 kg of cement per cu m)** of slurry fill / backfill.
  2. Minimum stable air content of 20 percent, Darafill dosage as necessary.
  3. Maximum water content of **36 gallons per yard (225 L per cu m)** of backfill.
  4. Maximum compressive strength of 150 psi at 28 days.
  5. Type Two Acceptable Products:
    - a. Darafill by W R Grace & Co, Cambridge, MA [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
    - b. Equal as approved by Architect before use. See Section 01 6200.
- D. Engineered Fill:
- 1.

## 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 Building Slabs / Pads, Concrete Site Elements, And Concrete Driveways And Parking Areas: 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.
  4. Landscape Areas: Compact sub-grade to 85 percent relative compaction.

### 3.2 PERFORMANCE

- A. Fill / Backfill:
1. General:

- a. Around Buildings And Structures: Slope grade away from building as specified in Section 31 2216. Hand backfill when close to building or where damage to building might result.
  - b. Site Utilities:
    - 1) In Landscape Areas: Use backfill consisting of on-site soil.
    - 2) Under Pavement And Concrete Site Elements: Extend excavatable slurry fill / backfill to elevation of subgrade. Do not place base material until excavatable slurry fill / backfill has cured 72 hours.
  - c. Do not use puddling or jetting to consolidate fill areas.
2. Compacting:
- a. Fill / Backfill And Base:
    - 1) Under Building Slabs or Pads, Driveways, And 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**

**SECTION 31 2324****GRANULAR BASE****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install granular base under interior slabs-on-grade as described in Contract Documents.
- B. Products Installed But Not Furnished Under This Section:
  - 1. Under-slab vapor retarder and seam tape.
- C. Related Requirements:
  - 1. Section 03 3053: Granular base under miscellaneous cast-in-place concrete.
  - 2. Section 31 0501: Common Earthwork Requirements.
  - 3. Section 32 1216: Base course under asphalt paving.

**1.2 REFERENCES**

- A. Reference Standards:
  - 1. ASTM International:
    - a. ASTM E 1643-98 (2005), 'Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.'

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Sequencing: Install vapor retarder and granular base system after application of termite control and before placing concrete. If termite control is disturbed or receives precipitation before being covered with vapor retarder, re-apply termite control.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Granular Base:
  - 1. Gravel: **1/4 inch (6 mm)** minimum to **one inch (25 mm)** maximum well-graded, clean gravel or crushed rock.

**PART 3 - EXECUTION****3.1 INSTALLATION**

- A. Place **4 inches (100 mm)** minimum of granular base and compact with two passes of 2-1/2 ton minimum roller.
- B. Do not allow water granular base before placing concrete.

**3.2 FIELD QUALITY CONTROL**

- A. Notify Architect 2 days before installation of concrete to allow inspection of granular base installation.

**END OF SECTION**

**DIVISION 32: EXTERIOR IMPROVEMENTS**

**32 1000 BASES, BALLASTS, AND PAVING**

32 1216 ASPHALT PAVING  
32 1723 PAVEMENT MARKINGS

**32 9000 PLANTING**

32 9001 COMMON PLANTING REQUIREMENTS  
32 9413 LANDSCAPE EDGING (02946)

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**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 driveways and 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. Action Submittals:
  - 1. Product Data: Manufacturer's published product data on pre-emergent herbicide.
- B. 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.
- 3. Manufacturer Instructions: Application instructions for pre-emergent herbicide.

**1.5 QUALITY ASSURANCE**

- A. Qualifications: Pre-emergent herbicide shall be applied by applicator certified by State in which Project is located as an applicator of agricultural chemicals.

**1.6 FIELD CONDITIONS**

- A. Ambient Conditions:
  - 1. Do not perform work during following conditions:
    - a. Ambient temperature or temperature of base below 50 deg F (10 deg C).
    - b. Presence of free surface water.
    - c. Over-saturated base and sub-grade materials.

**PART 2 - PRODUCTS**

**2.1 MATERIAL**

- A. Pre-emergent herbicide:
  - 1. Selective type pre-emergence control chemical containing 40 percent Trifluralin minimum.
  - 2. Labeled for under-pavement use.
  - 3. Type Two Acceptable Products:
    - a. Treflan or Spike 80W by Dow AgroSciences, Indianapolis, IN [www.dowagro.com](http://www.dowagro.com).
    - b. Trust 4EC by Agriliance LLC, St Paul, MN [www.agriliance.com](http://www.agriliance.com).
    - c. Equal as approved by Architect before installation. See Section 01 6200.
  
- B. Base:
  - 1. New Aggregate Base:
    - 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:
    - 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.

C. Asphalt Cement Primer: Meet requirements of ASTM D 2027, MC 70, plus or minus one grade.

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

E. 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.
  - 3) AC20 in hot 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) 1/2 inch	100
b) 3/8 inch	85 – 100
c) No. 4	65 – 80
d) No. 8	50 – 60
e) No. 30	25 – 40
f) No. 80	18 – 30
g) No. 200	3 – 8
h) 3 mm	100
i) 9.5 mm	85 – 100
j) No. 4	65 – 80
k) No. 8	50 – 60
l) No. 30	25 – 40
m) No. 80	18 – 30
n) No. 200	3 – 8

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 k) 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 INSTALLERS**

1. Paving companies shall be pre-approved and included in Construction Documents by Addendum.

**3.2 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.
- C. Pre-emergent Herbicide:
  1. Apply to prepared subgrade dispersed in liquid. Concentrate shall be such that Manufacturer's full recommended rate of chemical will be applied to every 1000 sq ft (100 sq m) and liquid will penetrate a minimum of 2 inches (50 mm).
  2. Application shall be no more than one day before installation of base.
  3. Take necessary precautions to protect adjoining property and areas designated for planting on building site.

**3.3 INSTALLATION**

- A. Tolerances:
  1. Sub-Grade: 0.00 inches (mm) 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, except where shown thicker on Drawings.
    - 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, except where shown thicker on Drawings. Paving thicker than 3 inches (75 mm) may be applied in two lifts, the first 2 inches (50 mm) thick minimum and the second 1-1/2 inches (38 mm) thick minimum.
    - 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. Priming: Prime base with application of 0.2 to 0.5 gallons (2 to 5 liters) of asphalt cement primer per square yard (meter) if pavement will be laid more than three days after compaction of base, or if precipitation is anticipated between completion of compaction of base and laying of pavement.
  4. Recompact unprimed base if it receives precipitation before pavement is laid.
  5. 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).

### 3.4 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. Arrange and pay for an independent testing laboratory, approved by the Project Manager, and select test locations, an equal number from near edges of paving and at random in field.
  2. Arrange for selected laboratory to make tests after completion of work of this Section. After testing, repair test locations (with same material) 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 20,000 sq ft (1,800 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.
    - c. All spills, spotting, or soiling of asphalt or liquid emulsion on concrete, sidewalks, curbs, waterways, buildings, etc., will be cleaned off thoroughly to Owner's satisfaction and will require approval by the Project Manager.

**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.
    - c. Red: Fire lanes and no parking zones.
  4. Type Two Acceptable Products:
    - a. 442XX Traffic Marking Paint by ICI Devoe, Cleveland, OH [www.devoepaint.com](http://www.devoepaint.com).
    - b. Set-Fast Traffic Marking Paint by Sherwin-Williams, Cleveland, OH [www.sherwin-williams.com](http://www.sherwin-williams.com)
    - c. Equal as approved by Architect before application. See Section 01 6200.
- 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. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
  - a. Premark Plus by Flint Trading Inc, Thomasville, NC [www.flinttrading.com](http://www.flinttrading.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 a 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**

**SECTION 32 9001**

**COMMON PLANTING REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Common procedures and requirements for landscaping work.
  - 2. Provide maintenance for new landscaping as described in Contract Documents.
- B. Related Requirements:
  - 1. Section 32 0501: Common Earthwork Requirements.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conferences:
  - 1. Participate in pre-installation conference specified in Section 31 2213.
  - 2. Schedule planting pre-installation conference after completion of Fine Grading specified in Section 31 2216, but before beginning landscape work. In addition to requirements of Section 01 3000:
    - a. Establish responsibility for maintenance of new landscaping during all phases of construction period.
    - b. Prepare two typical landscape planting excavations and conduct percolation test to verify that water drains away within two hours. Discuss results of percolation tests with Architect and Owner's representative.

**1.3 SUBMITTALS**

- A. Closeout Submittals: At completion of landscape work, submit two copies of typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year after contract maintenance period ends.

**1.4 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Installers:
    - a. Use trained personnel familiar with required planting procedures and with Contract Documents.
    - b. Planting shall be performed under direction of foreman or supervisor with minimum five years experience in landscape installations.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver packaged materials in containers showing weight, analysis, and name of Manufacturer. Protect materials from deterioration during delivery and while stored at site.
- B. Deliver sod, plants, trees, and shrubs in healthy and vigorous condition and store in location on site where they will not be endangered and where they can be adequately watered and kept in healthy and vigorous condition.

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

- A. Acceptable Installers:
  - 1. Approved by Architect bidding. See Section 01 4300.
- B. Approved landscaping installers shall be pre-approved and included in Construction Documents by Addendum.

**3.2 EXAMINATION**

- A. Inspect site and Contract Documents to become thoroughly acquainted with locations of irrigation, ground lighting, and utilities. Repair damage to these and other items adjacent to landscaping caused by work of this Section or replace at no additional cost to Owner.

**3.3 PREPARATION**

- A. Before proceeding with work, verify dimensions and quantities. Report variations between Drawings and site to Architect before proceeding with landscape work.
  - 1. Plant totals are for convenience of Contractor only and are not guaranteed. Verify amounts shown on Drawings.
  - 2. All planting indicated on Drawings is required unless indicated otherwise.
- B. Protection:
  - 1. Take care in performing landscaping work to avoid conditions that will create hazards. Post signs or barriers as required.
  - 2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.
  - 3. Keep site well drained and landscape excavations dry.

**3.4 INSTALLATION**

- A. Interface With Other Work: Do not plant trees and shrubs until major construction operations are completed. Do not commence landscaping work until work of Sections 31 2216 and 32 8423 has been completed and approved.
- B. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.
- C. Hand excavate as required.
- D. Maintain grade stakes until parties concerned mutually agree upon removal.
- E. When conditions detrimental to plant growth are encountered, such as rubble fill or adverse drainage conditions, notify Architect before planting.

**3.5 FIELD QUALITY CONTROL**

- A. Inspection:

1. Architect will inspect landscaping installation approximately two weeks before Substantial Completion. Replace landscaping that is dead or appears dead as directed by Architect within 10 days of notification and before Substantial Completion.

### 3.6 CLEANING

- A. Immediately clean up soil or debris spilled onto pavement and dispose of deleterious materials.

### 3.7 CLOSEOUT ACTIVITIES

- A. Replace damaged plantings at no additional cost to Owner.

### 3.8 PROTECTION

- A. Protect planted areas against traffic or other use immediately after planting is completed by placing adequate warning signs and barricades.
- B. Provide adequate protection of planted areas against trespassing, erosion, and damage of any kind. Remove this protection after Architect has accepted planted areas.

### 3.9 MAINTENANCE

- A. General:
  1. Before beginning maintenance period, plants shall be in at least as sound, healthy, vigorous, and in approved condition as when delivered to site, unless accepted by Architect in writing at final landscape inspection
  2. Maintain landscaping from completion of landscape installation to 30 days after Substantial Completion Meeting. Areas sodded or seeded after November 1st will accepted following spring approximately one month after start of growing season, May 1st or as determined by Architect, if specified conditions have been met.
  3. Replace landscaping that is dead or appears unhealthy or non-vigorous as directed by Architect before end of maintenance period. Make replacements within 10 days of notification. Lawn that does not live and has to be replaced shall be guaranteed and maintained an additional 30 days from date of replacement.
- B. Sodded Lawn:
  1. Maintain sodded lawn areas until lawn complies with specified requirements and throughout maintenance period.
  2. Water sodded areas in sufficient quantities and at required frequency to maintain sub-soil immediately under sod continuously moist 3 to 4 inches (75 to 100 mm) deep.
  3. Cut grass first time when it reaches 3 inches (75 mm) high. Continue to mow at least once each week throughout maintenance period. Remove clippings.
  4. Apply weed killer as necessary to maintain weed-free lawn. Apply weed killer in accordance with manufacturer's instructions during calm weather when air temperature is between 50 and 80 deg F (10 and 27 deg C).
  5. At end of 30 day maintenance period, fertilize lawns as recommended in Section 32 9113.
- C. Trees, Shrubs, And Plants:
  1. Maintain by pruning, cultivating, and weeding as required for healthy growth.
  2. Restore planting basins.
  3. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical positions as required.
  4. Spray as required to keep trees and shrubs free of insects and disease.
  5. Provide supplemental water by hand as needed in addition to water from sprinkling system.