PROJECT MANUAL AND SPECIFICATIONS

FOR

REPAIR AND PREVENTATIVE MAINTENANCE

of the

Seneca Allegany Parking Garage

Salamanca, NY

(DESMAN Project No. 51-22110)

Prepared For

Seneca Gaming Corporation
310 Fourth Street
Niagara Falls, NY 14303

May 20, 2022

Drawings & Specifications Prepared by:

DESMAN
Design Management

1100 West 9th Street, Suite 100
Cleveland, OH 44113
www.DESMAN.com

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END OF SECTION

DIVISION 0

PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 00 11 16 – NOTICE TO BIDDERS

Sealed proposals, addressed to Mr. Tony Canna, Director of Facilities, Seneca Allegany Resort & Casino, 777 Seneca Allegany Blvd., Salamanca, NY 14779 and endorsed on the outside of the envelope with the name of the Bidder and Contract Name will be received until 5:00 p.m. Eastern Standard Time on July 22, 2022 at which time said proposals will be received for furnishing the materials and performing the labor for the

REPAIR AND PREVENTATIVE MAINTENANCE
of the
SENECA ALLEGANY PARKING GARAGE
Salamanca, NY

in accordance with Plans and Specifications prepared by DESMAN, 1100 W. 9th Street, Suite 100, Cleveland, OH 44113.

Email copies of the BID PROPOSAL FORM ONLY will be received by the above date and time to Ed DeTullio at edetullio@desman.com.

The right is hereby reserved to reject any or all proposals, or adjust the scope of work to meet available funds. The use of token unit bid amounts so as to produce an unbalanced bid situation may be cause for bid rejection.

A Mandatory Pre-bid Conference will be held week ending June 24,2022, date and time to be confirmed. We will meet at the south building pylon on the southwest side of the casino near the intersection of 4th Street and Duggan Drive.

Electronic copies of Plans, Specifications and Proposal Form will be issued by DESMAN on Friday, May 20, 2022.

All questions regarding the Plans and Specifications should be addressed to the following:

Ed DeTullio
Project Manager
(440) 263-0720

END OF SECTION

SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

The *Instructions to Bidders,* AIA Document A701 – 2018 is a part of this contract, and is incorporated herein as fully as if here set-forth.

END OF SECTION

SECTION 00 22 13 – SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The Division 0 – Procurement and Contracting Requirements, Division 1 – General Requirements, Divisions 2 through 48 (as needed) Technical Specifications, the Construction Drawings, and all addenda issued during bidding compose the Contract Documents.

Proposals to be entitled to consideration must be made in accordance with the following instructions:

A. BID PROPOSAL FORM:

l. Bid Proposal Forms shall be submitted in electronic form by email by the due date as indicated in the Notice to Bidders. Within 3 days after the electronic bid, a written copy of the electronic bid shall be submitted in duplicate upon the form provided herein, and all blank spaces shall be fully filled; numbers shall be stated both in writing and figures; the signature shall be in long hand; and the completed form shall be without interlineations, alteration or erasure.

2. Each proposal shall be properly signed as follows:

a. When a CORPORATION with the name of the corporation, signature of an officer or other person properly authorized to enter into obligations for it and his title.

b. When a PARTNERSHIP with name of partnership and signature of one of the partners.

c. When SOLE PROPRIETORSHIP with his signature.

B. SCHEDULE OF CONSTRUCTION:

1. Construction activities shall only occur between the hours of 7:00 a.m. and 5:00 p.m. from Monday through Friday. Weekend work shall be coordinated through the Owner. All deliveries shall be made prior to 10:00 a.m. Laydown areas will be established at the Pre-Construction Meeting.

2. Execution of the Contract Documents will involve some consideration for allowing the Owners to carry on many of their normal functions. The Contractor shall be responsible not to make the conduct of normal daily business difficult or impossible due to noise, inaccessibility of non-work areas, odors, fumes or any hazardous condition.

3. The successful Contractor, prior to start of work, shall submit a schedule of activities for each day during the entire repair period for approval by Owner and Engineer. The schedule shall include drawings showing the general phasing of the work and shoring locations on the level below.

C. STARTING AND COMPLETION DATE:

1. Work shall start on the date specified in the Bid Proposal Form unless otherwise approved by the Owner. The work shall be performed strictly in accordance with the schedule proposed by the General Contractor (according to the requirements of B.4 above) and approved by the Owner and Engineer prior to starting of the work.

D. GENERAL

1. Should a bidder find discrepancies in, or omissions from the drawings or documents, or should he be in doubt as to their meaning, he should at once notify the Engineer, who will send a written instruction to all bidders. Neither Owner nor Engineer will be responsible for any oral instructions. Lack of such notification to the Engineer will indicate that the bidder considers the documents to be sufficiently complete to prepare a bid for complete installation including all necessary accessory parts.

2. The drawings and specifications shall be considered to be cooperative and anything appearing in the specifications which may not be indicated on the plans, or vice versa, shall be considered as part of the contract and must be executed by the contractor the same as though indicated by both.

3. Before submitting a proposal, bidders should carefully examine the drawings and specifications: Check all schedules, visit the site, fully inform themselves as to all existing conditions and limitations and shall include in the proposal a sum to cover the cost of all items included in that part.

4. Any addenda issued during the time of bidding shall be taken into account in preparing proposals, and shall become a part of the contract documents.

E. MISCELLANEOUS

1. All (local, state, and federal) laws, codes, ordinances, and regulations pertaining to this class or type of construction shall be obeyed in regard to preparation of bids, letting of contracts, and complete installation of work.

2. Wherever in the contract documents, a particular article, material, device, form of construction, fixtures, etc., is shown or specified, such article, material, device, form of construction, fixture, etc., shall be known as standard. All PROPOSALS SHALL BE BASED ON STANDARDS SPECIFIED, and where two or more are named, bidders may bid on any so named. The Contractor is responsible for any extra cost due to changes required by substitutions or selection of any other than the first named product. If field conditions exist which would preclude the installation of any product or system as designed by the Engineer, the Contractor shall include, in his bid, an alternate to the specified product or system for the Owner and Engineer's consideration and approval. If the Contractor assumes an alternate without identifying it in the bid and is thereby less in the bid, he is still liable for installation of the specified product or system.

3. SUBSTITUTIONS for standards may be bid ONLY AS ALTERNATES, and written approval secured from the Engineer prior to award of the Contract.

F. CONSTRUCTION CONTRACT ADMINISTRATION:

1. Successful bidders shall furnish to the Owner and Engineer the following:

   a. List of Sub-Contractors:

      i. Division of Work
      ii. Amount of Sub-Contract
      iii. Firm Name

iv. Address
v. Telephone Number
vi. Representative

b. List of Major Material Suppliers:

i. Division of Work
ii. Amount of Material Purchase Order
iii. Firm Name
iv. Address
v. Telephone Number
vi. Representative

c. Contract Cost Breakdown:

i. Shall be provided on AIA Form G-703.
ii. Application for Payment:

2. The Contractor shall furnish, free of charge, the necessary blank copies of AIA Form G702 and G703 for his applications for Payment.

3. Partial payments made as the work progresses shall in no way be considered as an acceptance of any portion of the labor or material embraced in the contract.

4. Material delivered at the site and approved by the Engineer and included in a certified estimate for partial payment shall become the property of the Owner and in no case shall such materials be removed from the site. However, if such material is stolen, destroyed, or damaged by casualty before being used, the contractor will be required to replace it at his own expense. Storage of materials shall comply with the manufacturer's instructions or recommendations

5. The Contractor, upon receipt of payment, shall reimburse each sub-contractor for labor and materials for which the contractor has received payment from the Owner. The Contractor upon receipt of payment shall pay each material supplier for materials for which the contractor has received payment from the Owner.

6. Contractor's requests for payment shall normally be submitted by the Contractor once a month.

7. During the course of work, a retainage of 10% will be withheld from work performed.

8. During the course of construction, payment on estimates approved by the Engineer and filed with the Owner shall be made within 30 days.

9. All monies paid on account to any contractor for materials or labor shall be regarded as funds in his trust for payment of any and all obligations relating to this contract and no such amount of monies shall be permitted to accrue to the contractor until all such obligations are satisfied. Evidence, satisfactory to the Owner, shall be submitted with each payment request to show that all current obligations relating to this work are satisfied before releasing any payment due on the work. The evidence shall include all lien waivers from the general contractor, subcontractors and material suppliers. Before payment of the final estimate, each contractor shall file an affidavit with the Owner, stating that monetary obligations relating to lienable items in connection with this work have been fulfilled. When the major portion of the project is substantially completed

and occupied, or in use, or otherwise accepted and there exists no other reasons to withhold retainage, the retained percentages held in connection with such portion will be released from escrow and paid to the Contractor, withholding only that amount necessary to assure completion. The balance of funds will be paid to the Contractor within thirty days from the date of completion and after acceptance by the Engineer and Owner. Provided, however, that nothing in this Contract shall be construed to create an obligation or incur a liability against the Owner in excess of the encumbrances issued to support this Contract.

10. Payment for materials stored, but not installed, may require the Engineer to visit the Contractors place of storage for verification of all items on the Contractor's certificate. He shall certify that the items are in agreement with the specifications, and approved their incorporation into the project.

11. The Progress Schedule required by the owner shall be based on starting construction upon receiving the Owner's authorization to proceed within 7 days after the notification of the award of the contract and completion of the Project as stipulated in the Contract. After contract is awarded, a meeting shall be held at the job before work is started, to be attended by representative of the General Contractor and all affected Subcontractors, the Engineer, and the Owner's Representative, to work out a definite schedule to be followed for starting and completing each Phase of the work and provide information for Progress Schedule.

G. PURPOSE AND INTENT:

1. In order to assist those invited to submit a proposal and their prospective subcontractors, the following source is available for consultation:

a. Engineering: Ed DeTullio
Structural Engineer
DESMAN
edetullio@desman.com

b. Site Coordination: Tony Canna
Director of Facilities
Seneca Allegany Resort & Casino
acanna@senecacasinos.com

H. BONDS AND WARRANTY

1. Each bidder shall submit with his bid, AIA Document A310-2010 Bid Bond Form.

2. The Owner reserves the right to retain the Bids of the three lowest Bidders until a responsible Bidder enters into Contract or until 60 days after Bid Opening Date, whichever is less, unless an extension is agreed upon by all parties.

3. If any bidder refuses to enter into Contract, the Owner shall retain his bid security per the terms of the AIA Document A310-2010.

5. Simultaneously with the delivery of the executed Contract, the successful bidder shall furnish to the Owner Performance and Payment Bonds as required according to the specifications.

6. Attorneys-in-fact who sign said bonds on behalf of a surety must affix to each bond a certificate of effectively dated copy of their power of appointment.

7. The Contractor is required to submit a Certificate of Five-Year Corrective Period for all the work performed under this Contract except as noted in Specification Section 01 78 36.

END OF SECTION

SECTION 00 42 43 – BID PROPOSAL FORM

Submitted by: Date:

To Mr. Tony Canna, Director of Facilities, Seneca Allegany Resort & Casino, 777 Seneca Allegany Blvd., Salamanca, NY 14779, for:

REPAIR AND PREVENTATIVE MAINTENANCE
of the
SENECA ALLEGANY PARKING GARAGE
Salamanca, NY

that the construction documents prepared by DESMAN, 1100 W. 9th Street, Suite 100, Cleveland, OH 44113 for the construction of said project and having also received, read, and taken into account the following addenda:

Addenda No.: _____

and likewise having inspected the site of and the conditions affecting and governing the cost and construction of said project, the undersigned hereby proposes to furnish all material and perform all labor, as specified and described in said Specifications and as shown in the plans for the said work, for the Contract Amount of:

_____ Dollars

($_____)

The extent of work included by this Sum represents the Base Contract offered for the category indicated below.

This Contract Amount is based on quantities as hereinafter listed for the restoration work and the cost of all other items required for the completion of the work. All items of material, labor, supplies, or equipment that are not specifically enumerated for payment as separate items, but which are reasonably required to complete the work as shown on the drawings or as described in the specifications, are considered as subsidiary obligations of the Contractor. No separate measurement or payment is made for them. Unit Prices shall include all charges for overhead and taxes, profit, insurance and shall be applied to net differences in the quantities. Should any mathematical errors be discovered in the preparation of these proposals, the correct extension of the bidder's unit price times the estimated quantity of work will be the basis for computing the true bid figure.

Unit Price for Base Contract (Work Installed)

1. GENERAL CONDITIONS:

The General Conditions shall include general project costs that are not specifically enumerated elsewhere in this Bid Proposal Form including, but not limited to, project management, supervision, permits mobilization/demobilization (including Specification Section 01 11 00), shoring, miscellaneous costs including those defined in Specification Section 01 11 00, Part 1.03C. The General Conditions shall be billed by the Contractor proportionally to the amount of work complete:

LUMP SUM = $_____

2. STRUCTURAL REPAIRS:

a. Partial depth removal (2 ½"± avg.) of the precast, prestressed concrete double tee slab in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified fiber reinforced concrete according to the Specifications and the details shown on the drawings. See Detail 1, Drawing S2.01. Paint repair locations to match existing according to the Specifications.

$_____/SF x 120 SF = $_____

b. **PARTIAL DEPTH TOPPING SLAB REPAIRS OVER BEAMS:** Partial depth removal (4"± avg.) of the cast-in-place topping slab over beams in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified fiber reinforced concrete according to the Specifications and the details shown on the drawings. See Detail 3, Drawing S2.03. Paint repair locations to match existing according to the Specifications.

$_____/SF x 500 SF = $_____

c. **FULL DEPTH SLAB STEM-TO-STEM REPAIRS**: Full depth removal (5"± avg.) of the precast, prestressed concrete double tee slab from stem to stem in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified fiber reinforced concrete according to the Specifications and the details shown on the drawings. See Detail 2, Drawing S2.02. Paint repair locations to match existing according to the Specifications.

$_____/SF x 440 SF = $_____

d. **FULL DEPTH SLAB STEM-TO-WALL REPAIRS**: Full depth removal (5"± avg.) of the precast, prestressed concrete double tee slab from stem to wall in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified fiber reinforced concrete according to the Specifications and the details shown on the drawings. See Detail 22, Drawing S2.07. Paint repair locations to match existing according to the Specifications.

$_____/SF x 20 SF = $_____

e. **PARTIAL DEPTH WALL REPAIRS:** Partial depth removal (4"± avg.) of the precast, prestressed concrete walls in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified form and pump repair material according to the Specifications and the details shown on the drawings. See Detail 7, Drawing S2.03. Paint repair locations to match existing according to the Specifications.

$_____/SF x 10 SF = $_____

f. **PARTIAL DEPTH HAUNCH REPAIRS:** Partial depth removal (4"± avg.) of the precast, conventionally reinforced concrete column haunches in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified form and pump repair material according to the Specifications and the details shown on the drawings. See Detail 8, Drawing S2.04. Paint repair locations to match existing according to the Specifications.

$_____/SF x 20 SF = $_____

g. **PARTIAL DEPTH SLAB SOFFIT REPAIRS:** Partial depth removal (2 ½"± avg.) of the precast, prestressed concrete double tee slab soffit in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified form and pump repair material according to the Specifications and the details shown on the drawings. See Detail 1, Drawing S2.01. Paint repair locations to match existing according to the Specifications.

$_____/SF x 30 SF = $_____

h. **PARTIAL DEPTH BEAM REPAIRS:** Partial depth removal (4"± avg.) of the precast, prestressed concrete beams in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified form and pump repair material according to the Specifications and the details shown on the drawings. See Detail 23, Drawing S2.08. Paint repair locations to match existing according to the Specifications.

$_____/SF x 120 SF = $_____

i. **PARTIAL DEPTH STEM REPAIRS:** Partial depth removal (4"± avg.) of the precast, prestressed concrete stems in the garage by approved methods at locations shown on the drawings, disposal of debris, providing supplemental or new epoxy-coated reinforcing steel as required, and restoring the concrete surface by furnishing and placing the specified form and pump repair material according to the Specifications and the details shown on the drawings. See Detail 1, Drawing S2.01. Paint repair locations to match existing according to the Specifications.

$_____/SF x 140 SF = $_____

j. **TEE-TO-TEE CONNECTION RE-WELD:** Re-weld broken tee-to-tee connections utilizing a certified welder. Actual repair locations are not shown on the drawings and will be identified by the Engineer in the field. See Detail 20, Drawing S2.07. All concrete work required to complete this work item will be applied to the appropriate unit price work item above. Paint repair locations to match existing according to the Specifications.

$_____/Each x 50 Each = $_____

k. **TEE-TO-TEE CONNECTION BISCUITS:** Install new supplemental tee-to-tee connection (CFRP Biscuit) according to manufacturer recommendations and the details shown on the drawings. Actual repair locations are not shown on the drawings and will be identified by the Engineer in the field. See Detail 11, Drawing S2.04. Paint repair locations to match existing according to the Specifications.

$_____/Each x 50 Each = $_____

3. **THERMAL AND MOISTURE PROTECTION:**

a. **CRACK SEALANT:** Rout existing cracks and install sealant by approved methods at locations shown on the drawings, disposal of debris, and install new sealant according to the Specifications and details shown on the drawings. See Detail 10 Drawing S2.04. Paint repair locations to match existing according to the Specifications.

$_____/ LF x 2,400 LF = $_____

b. **WINGED EXPANSION JOINT SYSTEM REPLACEMENT:** Remove the existing expansion joint system by approved methods at locations shown on the drawings, disposal of debris, and install a new expansion joint system according to the Specifications and details shown on the drawings. This item includes all the necessary work to provide acceptable conditions for the installation contractor of the new expansion joint system including blockouts and throat openings. See Detail 16, Drawing S2.06.

All concrete work required to complete this work item will be applied to the appropriate unit price work item above. Paint repair locations to match existing according to the Specifications.

$_____/LF x 110 LF = $_____

c. **TRAFFIC BEARING EXPANSION JOINT SYSTEM REPLACEMENT:** Remove the existing expansion joint system by approved methods at locations shown on the drawings, disposal of debris, and install a new expansion joint system according to the Specifications and details shown on the drawings. This item includes all the necessary work to provide acceptable conditions for the installation contractor of the new expansion joint system including blockouts and throat openings. See Detail 17, Drawing S2.06. All concrete work required to complete this work item will be applied to the appropriate unit price work item above. Paint repair locations to match existing according to the Specifications.

$_____/LF x 560 LF = $_____

d. **NON-TRAFFIC BEARING EXPANSION JOINT SYSTEM REPLACEMENT:** Remove the existing expansion joint system by approved methods at locations shown on the drawings, disposal of debris, and install a new expansion joint system according to the Specifications and details shown on the drawings. This item includes all the necessary work to provide acceptable conditions for the installation contractor of the new expansion joint system including blockouts and throat openings. See Detail 15, Drawing S2.06. All concrete work required to complete this work item will be applied to the appropriate unit price work item above. Paint repair locations to match existing according to the Specifications.

$_____/LF x 190 LF = $_____

e. **EXPANSION JOINT SYSTEM REPLACEMENT IN ELEVATOR LOBBY:** Remove the existing expansion joint system by approved methods at locations shown on the drawings, disposal of debris, and install a new expansion joint system according to the Specifications and details shown on the drawings. This item includes all the necessary work to provide acceptable conditions for the installation contractor of the new expansion joint system including blockouts and throat openings. See Detail 18, Drawing S2.06. All ceramic tile work required to complete this work item shall be included in this unit price. All concrete work required to complete this work item will be applied to the appropriate unit price work item above. Paint repair locations to match existing according to the Specifications.

$_____/LF x 350 LF = $_____

f. **WATERPROOFING SYSTEM:** Install the specified waterproofing system according to the manufacturer's recommendations as shown on the drawings. This item includes all the necessary work to provide acceptable conditions for the installation contractor of the new waterproofing system. See Detail 13, Drawing S2.05. All concrete work required to complete this work item will be applied to the appropriate unit price work item above.

$_____/SF x 50 SF = $_____

4. **PLUMBING:**

FLOOR DRAINS: Furnish and install new floor drains at locations shown on the drawings by removing existing drain, disposal of debris, installation of a new area drain, installation/tie-in of new piping according to the Specifications and details shown on the drawings. See Detail 14, Drawing S2.05. All concrete work required to complete this work item will be applied to the appropriate unit price work item above. Paint repair locations to match existing according to the Specifications.

$_____/Each x 10 Each = $_____

5. ELECTRICAL

ALLOWANCE: Electrical Allowance to replace deteriorated conduit and repair other electrical issues within the garage. Actual repair locations are not shown on the drawings and will be identified by the Owner and/or Engineer in the field.

ALLOWANCE = $ 50,000.00

6. METALS

ALLOWANCE: Miscellaneous Metals Allowance to replace deteriorated steel support angles within the garage. Actual repair locations are not shown on the drawings and will be identified by the Engineer in the field.

ALLOWANCE = $ 10,000.00

7. PERFORMANCE AND PAYMENT BONDS:

LUMP SUM = $_____

TOTAL BASE CONTRACT AMOUNT = $_____

Estimated Duration (Calendar Days) = _____ days

The Base Contract Amount covers all work in the Contract Documents and is based on completion of work as purposed. Base contract assumes 40-hour work weeks.

CONSTRUCTION TIME

The bidder agrees to commence work under this contract no later than July 11, 2022 unless otherwise approved by the Owner.

GENERAL

The bidder shall, before submitting his Proposal, carefully examine the Contract Documents. He shall inspect in detail the site of the proposed work and familiarize himself with all the local conditions affecting The Work and the detailed requirements of construction. If his Proposal is accepted, he will be responsible for all errors in his Proposal resulting from his failure or neglect to comply with these instructions or errors in judgment arising from said inspections of the work site and examination of the Contract Documents. The Engineer and/or the Owner will, in no case, be responsible for any losses or change in Contractor's anticipated profits resulting from such failure or neglect.

If the bidder finds any language in the Contract Documents inconsistent, vague or difficult to understand or interpret, for any reason, he shall request clarification in writing from the Engineer, not less than 5 (five) working days prior to the scheduled date for receipt of Proposals, and the Engineer shall issue a written response thereto in writing to all bidders known to the Owner. Unless the bidder seeks clarification in accordance with this paragraph, he will be deemed to have waived his rights, if any he had, to object to said Contract language as vague or misleading for any reason.

When the Contract Documents include information pertaining to surface observations, material testing and other preliminary investigations, such information represents only the opinion of the Engineer as to the location, character, or quantity of the materials encountered and is only included for the convenience of the bidder. The Owner/Engineer assumes no responsibility whatever in respect to the sufficiency or accuracy of the information, and there is no guarantee, either expressed or implied, that the conditions indicated are representative of those existing throughout The Work, or that unanticipated developments may not occur. Said information shall not be considered by the parties as a basis for the Contract award amount.

The Bidder agrees that adequate time was allowed the bidder to inspect all work sites and, unless express written request has been made therefore, the Owner/Engineer will be presumed to have supplied the bidder all the information and access required to adequately complete the Proposal.

The estimated quantities of work to be done and materials to be furnished under these Specifications are given in the Proposal. All quantities are to be considered as approximate and are to be used only for comparison of bids. The unit and lump-sum prices to be tendered by the bidders are to be for the scheduled quantities as they may be increased or decreased. Payments will be made to the Contractor only for the actual quantities of work performed and materials furnished in accordance with the Plans and Specifications.

The scheduled quantities of work to be done and materials to be furnished may each be increased or diminished or entirely deleted. Such changes may become necessary for the best interest of the project due to circumstances not known at the time the Contract was entered into or arising thereafter. In the event, in the sole judgment of the Engineer or its representative, such changes become necessary, the unit and lump sum prices set forth in the Proposal and embodied in the Contract shall remain valid.

Any extra work beyond the scheduled quantities requiring additional cost to the Owner shall be approved by the Owner prior to taking such action. Claims for extra work which have not been authorized in writing by the Owner and approved by the Engineer will be rejected and the Contractor shall not be entitled to payment thereof.

RIGHT TO REJECT BIDS AND SIGNING CONTRACTS

In submitting this Bid, it is understood that the right is reserved by the Owner to reject any and all bids. If written notice of acceptance of this bid is mailed, telegraphed or delivered to the undersigned within sixty (60) days after the opening thereof, or at any time thereafter before this Bid is withdrawn by written notification, the undersigned agrees to execute and deliver a Contract in the prescribed form. The work shall be commenced by the Successful bidder on the date specified in the notice after the Contract is executed.

BID GUARANTEE

The undersigned agrees that this bid may be held by the Owner for a period not exceeding sixty (60) days from the date set up for the opening of bids and that the bid may not be withdrawn within that period.

IN WITNESS WHEREOF, the undersigned Bidder has caused its/his signature and seal to be affixed thereto by it duly

authorized officers this _____ day of _____, 20_____.

Firm Name:_____

By:_____

Title:_____

Telephone No.:_____

Official Address:_____

_____

Attest:_____

Secretary:_____

END OF SECTION

SECTION 00 43 13 – BID SECURITY FORM

The *Bid Bond,* AIA Document A310 – 2010 is a part of this contract, and is incorporated herein as fully as if here set-forth.

END OF SECTION

SECTION 00 43 36 – PROPOSED MATERIAL SUPPLIERS AND SUBCONTRACTORS FORM

Note: All contractors shall fill in the following information prior to award of contract

	Name of Supplier and Address:	Products to Be Supplied:
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

	Name of Subcontractor and Address:	Anticipated Dollar Amount:	Service/Trade to Be Supplied:
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

END OF SECTION

SECTION 00 45 13 – BIDDER'S QUALIFICATIONS

The Owner requires all prospective contractors to complete this statement in advance of consideration of application to bid or as a qualification statement in advance of award of contract.

The undersigned certifies under oath the truth and correctness of all statement and of all answers to questions made hereinafter.

Submitted to: Tony Canna
Director of Facilities
Seneca Allegany Resort & Casino
777 Seneca Allegany Blvd.
Salamanca, NY 14779

Submitted by:

Name: _____

Address: _____

1. Type of Organization (Check One) - [ ] Corporation [ ] Partnership [ ] Individual [ ]JointVenture [ ] Other

2. How long has the Organization been in business as a general Contractor?

3. How many years has the organization been in business under its present business name?

4. Under what other or former name(s) has the organization operated?

5. If a corporation, answer the following:

   a. Date of Incorporation: _____

   b. State of incorporation: _____

   c. President's name: _____

   d. Vice President's name: _____

   e. Secretary's name: _____

   f. Treasurer's name: _____

6. If individual or partnership, answer the following:

   a. Date organization: _____

   b. Name and address of all Partners:

   _____

   _____

   _____

   _____

7. If other than corporation or partnership, describe organization and name principals:

8. What geographical area does the organization normally do business in?

9. List experience with project the size and nature of the proposed job.

10. What similar projects does the organization currently have under way?

11. List similar projects completed during the past three to five years.

12. Have you ever failed to complete any work awarded? ____ yes ____ no
    If so, why?

13. How many Owners have contracted with the firm for repeat business?

14. Has any officer or partner of your organization ever been an officer or partner of another organization fail to complete a construction contract? ____ yes ____ no

    If so, state circumstances:

15. What percentage of work is done with your workforce? _____%
    List trades:

16. What is the size of your staff?

17. Does the firm have special in-house experts such as trained personnel in estimating, purchasing, and computer services?

18. How are work crews organized?

19. How are your employees trained to perform their duties?

20. Trade References:

21. Bank References:

22. Name of Bonding Company and name and address of agent:

23. Provide two copies of certificates of insurance that evidences protection from claims under Workman's Compensation and claims for damage which may arise from operations under his control.

24. Attach Statement of Financial Condition; including Contractor's latest regularly dated financial statement as balance sheet.

Name and address of firm preparing statement:

_____

_____

_____

Signature: _____

Title: _____

Date: _____

END OF SECTION

SECTION 00 52 13 – AGREEMENT FORM

The *Standard Abbreviated Form of Agreement Between Owner and Contractor,* AIA Document A104-2017 is a part of this contract, and is incorporated herein as fully as if here set-forth.

SECTION 00 54 00 – AGREEMENT FORM SUPPLEMENT

NOTE: The terms "Architect" and "Engineer" shall be interpreted as the Engineer-of-Record, DESMAN, Inc. for the purposes of all relative contract documentation.

1. The General Conditions of the Contract for Construction

   The General Conditions of this bidding is the AIA Document A104 - 2017, "Standard Abbreviated Form of Agreement between Owner and Contractor", Articles, 7 through 21 hereinafter referred to as the "AIA General Conditions", as amended and is incorporated herein as if here set-forth.

2. The Supplementary General Conditions

   The supplementary General Conditions contains changes and additions to the AIA General Conditions. Where any part of the AIA General Conditions is modified or voided by the Supplementary General Conditions, the unaltered provisions shall remain in effect.

3. Amendments by the Supplementary General Conditions:

   ARTICLE 17 - INSURANCE AND BONDS

   Add the following to Paragraph 17.1:

   All insurance coverage required pursuant to Article 17 of the General Conditions shall be carried by a company or companies licensed to do business in the state where the Work is to take place and reasonably acceptable to the Owner. In addition to the requirements of Subparagraph 17.1, the following insurance provision shall apply. All insurance certificates must list the names of Seneca Nation of Indians, Seneca Gaming Corporation, Seneca Territory Gaming Corporation, Seneca Allegany Resort & Casino, and DESMAN as additionally insured.

   A. Liability Insurance

      1. The Contractor and each subcontractor, performing work on any portion of the Property shall procure and maintain at their sole cost and expense, during the entire period of their performance under this Contract, the following minimum insurance in insurance companies and in policies of insurance acceptable to Owner. Refer to Specification Section 00 73 16 Supplementary Insurance Requirements for the minimum insurance requirements.

      2. Before commencing the Work, the Contractor and each subcontractor will supply Owner with a certificate of insurance, evidencing compliance with the minimum requirements listed in Article 17. Each certificate shall state that the insurance evidenced by such certificate will not be canceled or reduced, not deductibles increased, without thirty (30) days prior written notice to the Owner.

      3. Contractor shall maintain a file of certificates of insurance from each subcontractor.

      4. The Contractor and subcontractors shall have the Owner, its Board of Directors, the Engineer and their respective officers, directors, employees and agents added as additional named Insured Parties to the above Comprehensive General Liability Insurance policy. In

addition, the subcontractors shall also name the Contractor and his respective officers, directors, employees and agents added as additional named Insured Parties.

B. Property Insurance

1. Except as otherwise provided, the Owner shall purchase and maintain property insurance on the building with amounts and coverage as the Owner deems satisfactory.

2. The Contractor shall purchase and maintain property insurance on such goods and building materials to the full insurable value thereof, while such goods are in transit or while stored at the work site or any other location. This insurance shall include interests of Owner (as loss payee with respect to any goods or materials paid for by Owner), Contractor, and Subcontractors in the work, and shall insure against Fire, Extended Coverage and All Risk Perils. This policy of insurance shall bear a deductible which shall be borne by the Contractor.

3. The Owner, Contractor and all subcontractors waive all rights against each other for damage caused by fire or other perils to the extent covered by insurance provided under paragraph B.1 and B.2 hereof, except such rights as they may have to the proceeds of such insurance.

4. The Owner is hereby given permission to occupy and use the building to continue normal daily use.

5. The Owner shall not be responsible for nor shall it insure the personal property of the Contractor and/or subcontractor including, but not limited to, tools and equipment located at the job site which are intended to be incorporated into the Work.

6. Contractor shall maintain Contractors Equipment Floater Insurance for owned or leased equipment under his care, custody and control as required for the performance of the Contractor's duties. Such insurance shall be for the sole benefit of the Contractor and shall not relieve the subcontractors of their responsibilities to maintain insurance as required herein.

7. The Owner, at its option, may purchase and maintain such insurance against loss of use of its property or boiler and machinery due to fire or other hazards, however caused.

8. Fire Insurance and Extended coverage on the building in which the work of the Contractor is to be performed will be maintained by the Owner.

9. The Owner shall effect and maintain Multi-Peril insurance upon all Work, materials and equipment incorporated in the Project and all materials and equipment on or about the Premises intended for permanent use or incorporation in the Project or incident to the construction thereof, all temporary structures, materials and supplies, and all materials including any contractor's machinery, tools, equipment, appliances or other personal property owned, rented or used by the Contractor or anyone employed by it in the performance of the Work. The Owner is not responsible for theft of materials of any kind. The Engineer, Contractor and Subcontractors shall be named as additional insureds. The policy will include a waiver of subrogation against the Contractor and Subcontractors with respect to this policy.

C. Claims

For any and all claims against the Owner, its Board of Directors, the Engineer or any of their respective officers, directors, agents or employees by an employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the insurance obligation under this paragraph shall not be limited by the amount or type of damages, compensation or benefits payable by or for the contractor or any Subcontractor under workmen's compensation disability benefit, or other employees benefit statute.

D. Engineer

The insurance obligations of the Contractor under this Paragraph shall not extend to the liability of the Engineer, his agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, design or specifications, or the giving of directions or instructions by the Engineer, his agents, or employees to the extent that such preparation, approval, directions or instructions are the cause of the injury or damage.

END OF SECTION

SECTION 00 61 13 – PERFORMANCE BOND AND PAYMENT BOND FORMS

The *Performance Bond a*nd *Payment Bond Forms*, AIA Document A312 – 2010, are a part of this contract, and are incorporated herein as fully as if here set-forth.

END OF SECTION

SECTION 00 65 36 – CERTIFICATE OF FIVE-YEAR CORRECTIVE PERIOD

Date of Issuance _____

THIS IS TO CERTIFY THAT, in accordance with the terms of a contract executed the _____ day of _____, 20 _____ by and between _____ (Contractor), and _____ (Owner) for _____ (Project name), the five-year period for correcting work found to be defective or not in accordance with the Contract Documents as stipulated in the General Conditions to the contract, by the above-named contractor, will expire on the _____ day of _____, 20 _____. The status of account under the above contract is as follows:

Original Contract Sum	$_____
Net Change by Change Orders	$_____
Final Contract Sum	$_____
Total Certified to the Owner	$_____
Amount Not Yet Certified	$_____

The Contractor, having examined the above Certificate, finds it correct and acknowledges receipt upon the _____ day of _____, 20 _____.

_____
Signature

_____
Printed Name

_____
Title

NOTE: Work to be corrected within this period does not cover any normal maintenance work that has been abused or neglected by the Owner or his successor. The issuance of this Certificate and its acceptance are his without prejudice to any other rights of the Owner or Contractor under their Contract.

END OF SECTION

SECTION 00 73 00 – SUPPLEMENTARY CONDITIONS

1. GENERAL

Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to work specified in this Section.

2. SPECIAL CONDITIONS

A. Examination of the Site:

All contractors submitting proposals for this work shall first examine the site and all conditions thereon. All proposals shall take into consideration all such conditions as may affect the work under this contract.

B. Progress Charts:

1. As soon as practicable (not more than 15 days) after the award of the contract, the Contractor shall furnish progress charts to the following:

   a. Owner
   b. Project Manager
   c. Resident Engineer
   d. Job Superintendent

2. May be bar type or CPM charts

3. Revise charts as work progress deviates from chart schedule or when requested by the Engineer.

C. Field Measurements:

The general Contractor shall take measurements in the field to verify or supplement dimensions indicated on drawings and shall be responsible for accurate fit of specified work.

D. Protection:

1. The Contractor shall install and maintain protection to slab attachments such as sprinkler lines, ventilation ductwork, and fans etc. prior to concrete removal.

2. The Contractor shall provide and maintain adequate lighting for proper inspection of his work.

3. The Contractor will be held responsible for all his work and materials provided for by the plans and specifications until the work is completed and accepted.

E. Ventilation:

1. The General Contractor shall provide effective ventilation of the structure throughout the construction period. All fumes generated by the membrane work must be safely

removed from the facility. The Contractor shall be completely responsible for any damages arising from inadequate ventilation during coating work.

2. The ventilation shall be under control to avoid excessive rates of dust.

F. Lawful Fees:

All contractors shall obtain and pay for all permits, licenses, certificates, inspections or other legal fees both permanent or temporary that are required for the execution of his contract.

G. Weather Protection:

1. All contractors shall at all times provide protection against weather so as to maintain his work, materials, apparatus, and fixtures free from injury or damage. The end of the day's work, all new work likely to be damaged shall be covered.

2. During cold weather the Contractor shall protect all work from damage. If low temperatures make it impossible to continue operations safely in spite of cold weather precautions, the Contractor shall cease work.

3. Any work damaged by failure to provide above protection shall be removed and replaced with new work at the Contractors' expense.

H. Project Site:

See Specification Section 01 11 00 Summary of Work.

I. Work in Existing Building:

1. Each contractor shall be responsible for all work related to his respective trade and shall remove, cut-off, and cap, rewire, or repipe existing electrical, plumbing, heating, and ventilating lines and materials as required.

2. The General Contractor shall furnish and install all temporary dustproof partitions or barriers, cover all supply and exhaust grilles, and hang dust cloths and drapes as required to protect garage portions designated for parking spaces from construction dirt and debris.

3. Wherever demolition and cutting work has occurred, or where existing surfaces and materials of items or equipment have been damaged or disturbed as a result of this contract, the said surfaces and areas shall be carefully closed up, patched, and finished, and materials of items or equipment shall be repaired, restored or, replaced as required to completely restore all such surfaces, areas, materials, etc. All surfaces patched and restored shall match the existing surrounding surfaces and they shall be completely and properly finished.

J. Restoration:

Where existing, properties, streets, paving, curbs, etc. are removed or damaged as result of work operations, the responsible contractor shall restore the foregoing items to match the original conditions or as required by local authorities.

K. Guarantees:

See Specification Section 01 78 36 Warranties.

L. Clean Up:

1. During construction the general contractor shall do the following:

   a. Oversee cleaning and ensure that the building and grounds are maintained free from accumulations of waste materials and rubbish.

   b. Clean up work area and dispose of waste materials, rubbish, and debris daily during the progress of the work.

   c. Provide one container for use by each subcontractor for collection of waste materials, rubbish, and debris.

   d. Do not allow waste materials, rubbish, and debris to accumulate and become an unsightly or hazardous condition.

   e. Legally dispose of all waste materials in public or private dumping areas.

   f. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly installed surfaces and materials.

2. During final cleaning, the General Contractor shall do the following:

   a. Use experienced workmen, or professional cleaners for final cleaning.

   b. At completion of construction and just prior to acceptance of occupancy, conduct a final inspection of exposed interior and exterior surfaces.

   c. Remove grease, dust, stains, labels, fingerprints, and other foreign materials from interior and exterior surfaces.

   d. Repair, patch, and touch-up marred surfaces to match adjacent finishes.

   e. Wash both surfaces of all existing glass.

   f. Clean any ductwork, light fixtures, or piping exposed to construction dust.

M. Jobsite Safety:

Caution shall be exercised by the Contractor at all times for the protection of persons and property and all safety regulations and other provisions of applicable Federal, State and local laws, Building and Construction codes, including the requirements of the Occupational Safety and Health Administration and the State Industrial Commission shall be observed.

The Plans do not include standards or guidelines for construction safety. The Contractor shall be responsible for the adequacy and safety of all construction methods and the safe prosecution of the Work, including but not limited to forms, falsework, scaffolding, protective barricades, protective rails, and warning lights. It is expressly stipulated that any examination and/or approval by the Engineer of the Contractor's plans for such items as well as for any other items needed for the prosecution of the Work will cover only general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Contractor shall assume full and complete responsibility for safe prosecution of the Work at all times and for obtaining satisfactory results.

During the course of the performance of the Work under the Contract, if any operation, practice, or condition is deemed by the Engineer to be unsafe, the Contractor, when notified verbally, later confirmed in writing by the Engineer, shall take such corrective action immediately as appropriate.

Nothing in the foregoing paragraphs shall be construed as relieving the Contractor from full responsibility of safe prosecution of the Work at all times. In the event the Owner, the Engineer or his representative are held by court of administrative body to be liable for personal injuries or damages to property arising from deficiencies in the job-site safety, the Contractor shall promptly indemnify and hold them harmless.

END OF SECTION

SECTION 00 73 16 – SUPPLEMENTARY INSURANCE REQUIREMENTS

Insurance Certificates shall be furnished by the Contractor which shall include liability, property damage, builder's risk, and Workman's Compensation. Completed Insurance Certificate's shall be submitted to the Owner and Engineer prior to commencing work.

Liability insurance shall include all major divisions of coverage and be on a comprehensive basis.

Comprehensive General Liability:

Employer's Liability $3,000,000.00

Personal Injury.....$3,000,000.00/each person
$3,000,000.00/each occurrence

Property Damage .....$3,000,000.00/each person
$3,000,000.00/each occurrence

Automobile Liability:

Bodily Injury.....$500,000.00/each person
$1,000,000.00/each occurrence

Property Damage .....$500,000.00/each occurrence

Umbrella Liability:

Umbrella Liability .....$10,000,000.00/each person
$10,000,000.00/occurrence

Independent Contractors:

Same limits as above

END OF SECTION

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 INTENT OF PLANS AND SPECIFICATIONS

A. The intent of the Plans and Specifications is to describe the work which the Contractor undertakes to do, in full compliance with the Contract, and it is understood that the Contractor will furnish, unless otherwise provided in the Contract, all materials, machinery, equipment, tools, supplies, transportation, labor, and all other incidentals necessary to the satisfactory prosecution and completion of the Work. The Plans and Specifications are complementary, and what is called for by either is as binding as if called for by both.

B. The Special Conditions shall control where in conflict with the Standard Specifications. However, such portions of the Standard Specifications not in conflict or not rendered meaningless by the Special provisions shall remain in full force and effect and be binding on the parties hereto.

C. In the event the Contractor discovers any error or discrepancy in the Contract Documents, he shall immediately call upon the Engineer for his decision. The Engineer shall then make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the Specifications, Special Provisions, Plans and other Contract Documents, as construed by him and his decision shall be final.

1.03 SUMMARY OF WORK

A. General Mobilization: This work consists of all labor, materials, tools and equipment required for setting-up general plant, storage/staging areas and facilities required by State Laws and City Ordinances; and the general mobilization of equipment required for the completion of the work shown on the Contract Documents. The cost of this item shall include all permits and fees required to perform the project, unless otherwise noted in the Contract Documents, and all expenses for the de-mobilization after the work has been completed. If a building permit is required, it will be the contractor's responsibility to get the necessary permit to perform the repair work, unless noted otherwise in the documents. This work shall also include the following items:

1. Reviewing existing electrical layout and existing conditions for each phase of the work to identify all embedded conduits/wiring in the slabs. All existing mechanical and electrical services shall be maintained/restored by the Contractor for all work areas.

2. Provide effective ventilation system to safely remove all dust and hazardous fumes generated from the concrete demolition and any surface treatment applications.

3. Protection and/or relocation of fire protection system, if any, in order to implement repairs.

4. Protection and/or relocation of existing mechanical and electrical systems, in order to implement repairs.

5. Removal of loose overhead concrete from the structural concrete members in the structure prior to the start of any demolition work.

6. Coordinate and assist the security and property management personnel in respect to the security of commercial spaces during the repair work.

7. Electricity (power) and water required for the completion of the work will not be furnished by the Owner. All costs associated with power and water are at the contractor's expense. Any costs associated with power/water must be included in the contractor's bid.

B. Below is a summary of the work and may not include all work items that the contractor will be responsible for during the project. The work, in general, consists of the following areas:

1. Project mobilization and demobilization, including all permits as required.

2. Implement repairs in a logical manner. The contractor shall submit phasing plans to the owner and engineer for approval. Refer to the construction sequence plans for work included in the base bid.

3. Design, installation, and maintenance of the entire shoring system. The owner and engineer do not take any responsibility for the determination of whether shoring is required for any repairs or not.

4. Perform concrete slab repairs at locations designated on the drawings according to the specifications and the repair detail sheets.

5. Perform concrete column, beam, stem, and wall repairs at locations designated on the drawings according to the specifications and the repair detail sheets.

6. Installation of flexible sealant in cracks, construction joints, control joints cove joints, etc. According to the specifications and the repair detail sheets.

7. Remove and replace expansion joints at locations designated on the drawings according to the specifications and the repair detail sheets.

8. Remove and replace floor drains at locations designated on the drawings according to the specifications and the repair detail sheets.

9. Perform electrical conduit repairs at locations designated by the Owner and Engineer.

10. Perform miscellaneous steel repairs at locations designated by the Engineer.

11. Install striping in parking areas, directional markings in traffic areas, and safety markings at all curbs, islands, stairs, etc. Affected by construction activities according to the specifications.

12. Demobilize and sweep clean or powerwash all areas affected by the work. This includes cleaning all light fixtures, signage, parking equipment, stair towers, elevators, exhaust equipment, fire protection system, etc. That have been impacted by the repair process.

C. Miscellaneous Items: This work consists of items not otherwise specifically indicated or shown on the plans, but which are ancillary to the specified scope of work. This work shall also include the following:

1. The Contractor shall furnish, install, maintain, relocate, and remove all construction fences, signs, barricades, cones, warning lights, and other safety control devices and temporary signage required for the proper execution of the project. The Engineer shall review the safety control device placement before work begins and also prior to the beginning of work on any subsequent construction stages. Any deficiencies in the location or arrangement of devices shall be corrected by the contractor before starting work.

2. The miscellaneous work shall include the cost of repairs to the non-functioning electrical/mechanical systems caused by the contractor's construction activities, for the entire work area. The contractor shall submit to the Engineer the documentation of all existing non-functioning electrical/mechanical systems in the entire work areas. This documentation should be based on the contractor's condition survey performed immediately prior to the scheduled mobilization. The contractor shall not start the mobilization until the Engineer approves the submittal. Repairs to non-functioning electrical/mechanical systems caused by the Contractor's construction activities shall be done by the Owner's Subcontractors at the Contractor's expense or as directed by the Owner or Engineer.

3. At repair areas, the contractor shall provide adequate protection and support systems, as required, for the existing mechanical, plumbing, and electrical installations to remain in-place and/or remove and re-install such items to implement repairs.

4. Work area enclosures: Floor-to-ceiling partitions/enclosures are to be utilized where the construction areas abut areas of the garage that are to remain open to the public. The lower 4'-0" of the partitions shall be plywood; the remaining upper portions to be either plywood or 10 mil polyethylene sheeting. At all other locations around the perimeter of the work area, primarily at the exterior elevations of the garage, the openings shall be sealed with 10 mil polyethylene sheeting. In work areas on the roof level and exposed to the sky, only 4'-0" high plywood partitions are required.

   All doors, including elevator and stair tower doors, and any other opening to occupied space (windows, vents, louvers, intakes, etc.) that are near the construction area and may be subjected to construction dust and debris shall be sealed with polyethylene sheeting. The materials that are utilized to enclose the construction areas shall result in a near air-tight seal, which will control and prevent the dispersion of dust and debris. Contractor may be required to utilize expandable foams, clamps, and various adhesives to provide a near air tight enclosure. Equip partitions with dust resistant doors and security locks. All claims by customers of the facility due to dust, debris, and damage to cars will be passed on to the Contractor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 21 00 – ALLOWANCES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Modified General Conditions and other Division 01 through 50 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, the Contractor shall advise Owner and Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Owner or Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. If applicable, purchase products and systems selected by Owner or Architect from the designated manufacture supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for work included in allowances.

1.5 INFORMATIONAL SUBMITTALS

A. If applicable, submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. If applicable, submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM, UNIT-COST, AND QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor cost for receiving and handling at Project site, labor, installation of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight**,** and delivery to Project site.

B. Unless otherwise indicated, Contractor's overhead, bonds, insurance, profit, general conditions and supervision related to products, materials and labor ordered by Owner and or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. The Owner or Architect will prepare a Change Order plus document the allowances to the Contract Sum.

2. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. See Bid Form.

END OF SECTION

SECTION 01 22 00 – UNIT PRICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

B. Section specifies administrative and procedural requirements for unit prices.

1. A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials and/or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.

2. Unit prices include all necessary labor, materials, equipment and incidentals, overhead, profit and applicable taxes.

3. Refer to Construction Documents for construction activities requiring the establishment of unit prices. Methods of measurement and payment for unit prices are specified in the Construction Documents.

C. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor. The Owner will pay the cost for the independent surveyor if the Contractor is found to have submitted accurate quantities. However, if the quantities differ the Contractor will be responsible for payment of independent surveyor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 UNIT PRICE SCHEDULE FOR BASE BID WORK

A. Unit prices for all items are as shown in the Bid Proposal Form shall be considered an integral part of this Section.

3.02 PAYMENT FOR EXTRA WORK

A. Extra work which results from any of the changes as specified and for which no unit price is provided in the Contract, shall not be started until receipt of a written authorization or work order from the Owner, which authorization shall state the items of work to be performed and the method of payment for each item. The Contractor shall not be entitled to payment for work performed without such authorization.

B If it is practicable to pay for Extra Work on the unit price, or lump sum basis, a fair and equitable sum shall be fixed by agreement of the parties and shown in an Extra Work Order Agreement. Work to be performed directly by the Contractor should be submitted showing a detailed breakdown of labor and material costs to which a 15 percent markup should be added for overhead and profit.

C Work to be performed by the subcontractor should be submitted showing a detailed breakdown of labor and materials by the subcontractor to which a five percent markup should be added by the Contractor for overhead and profit.

D When the Owner deems it impracticable to handle any Extra Work on the unit price or lump sum basis, or if agreement of the parties cannot be reached, the work may be ordered done and paid for on a Force Account basis, as follows:

1. Labor: The Contractor will be paid the actual amount of wages for all labor and foremen who are actually engaged in such work, to which cost shall be added 10 percent of the sum of such wages. A foreman shall not be used when there are less than three laborers employed, except with the written consent of the Engineer.

2. Welfare and Pension Fund: The Contractor will receive the actual additional amount of contributions paid for regular and uniform health and welfare benefits, pension fund benefits or other benefits, to which 10 percent shall be added, when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the class of labor employed on the Work.

3. Insurance and Tax: The Contractor will receive the actual cost or increase in cost of Contractor's Public Liability and Property Damage insurance, Workmen's Compensation tax, and Social Security tax required for Force Account work. The Contractor shall furnish satisfactory evidence of the cost or rates paid for such insurance and tax.

4. Materials: The Contractor will receive the actual cost for all materials, including freight charges as shown by the original paid invoices, which become an integral part of the finished work, to which shall be added 10 percent of the sum thereof.

   The Contractor will be reimbursed for any materials used in the construction of such work as sheeting, falsework, form lumber, etc., which are not an integral part of the finished work. The amount of reimbursement shall be agreed upon in writing before such work is begun, and no percent shall be added. The salvage value of such materials shall be taken into consideration in the reimbursement agreed upon.

5. Equipment: For any machinery or special equipment (other than small tools), the use of which has been authorized by the Engineer, the Contractor will be paid as following:

   a. For his own equipment, he will be paid by the monthly rate in accordance with the latest edition of Means Construction Cost Data.

   b. For rental equipment, he will be paid for the actual invoice amount as shown by the original paid invoices.

   The equipment shall be of a type and size reasonably required to complete the Extra Work. Compensation will not be allowed for transportation to or from The Work or for the time

required for setting up and removing the equipment from The Work or for equipment of a type, size or condition unsuitable for The Work.

3.03 CANCELED ITEMS:

A It shall be in the sole judgment and sole discretion of the Engineer or its representatives to cancel or alter any or all portions of the Contract due to circumstances either unknown at the time of bidding or arising after the Contract was entered into. Should such actions result in elimination or non-completion of any portion of the Contract, payment shall be made as follows:

1. For the canceled work completed by the Contractor, payment shall be made to the Contractor for the actual number of units or items completed at the Contract unit or lump sum prices. For canceled work partially completed by the Contractor, payment shall be made to the Contractor for the partially completed units or items as specified in Payment for Extra Work.

2. For materials obtained by the Contractor for the unfinished (uncompleted) portions of the canceled work, that have been inspected, tested and accepted by the Engineer, and that have not been incorporated in the canceled work, payment shall be made to the Contractor for the actual costs for all such materials, including freight charges, as shown by the original paid invoices, to which shall be added 10 percent of the sums thereof. The materials, when so paid for by the Owner, shall become the property of the Owner.

3.04 PARTIAL PAYMENTS:

A. The Engineer shall review the Contractor's pay request for materials in-place and completed, the amount of work performed, and the value thereof, at the Contract Unit Prices. From the amount so determined there shall be deducted ten percent to be retained until after the completion of the entire work to the satisfaction of the Engineer, and the balance certified to the Owner for payment. Notwithstanding the above, after 50 percent or more of the work is completed, the Engineer may certify the remaining partial payments or some of them without any further retention, provided that satisfactory progress is being made in accordance with the Contract requirements and continues to be made, and provided that the amount retained shall not be less than five percent of the total adjusted Contract Price.

B. If stored matter is lost or damaged prior to incorporation in The Work, the materials shall be replaced or satisfactory repaired at the Contractor's expense. Where payment is made for materials in storage and not yet incorporated into The Work, the Contractor shall provide to the Owner, satisfactory evidence of insurance against loss by damage or disappearance. The Contractor shall pay and be responsible for cost of storage, if any, of said materials.

3.05 ADJUSTMENT OF UNIT PRICES BASED ON ACTUAL QUANTITIES PERFORMED

A. For unit price bid items, the quantities as listed in the schedule of bid items are estimates only. The Contractor will be required to complete the work specified in accordance with the Contract and at the quoted unit prices, whether quantities greater or less than the estimated amounts are involved. Should the actual quantity of a unit price pay item vary from the original estimate, the following adjustments to the unit prices shall be made:

1. When the actual quantity of a unit price pay item is less than 75 percent of the original bid estimate, the Contract will be paid an amount equal to the actual quantity times the

original unit price plus 10 percent of the difference between this amount and the original estimated quantity times the original unit price for that particular item.

2. When the actual quantity of a unit price pay item is greater than 120 percent of the original bid estimate (based upon prior approval to exceed this quantity by the University and Engineer) the Contractor will be paid for the actual work performed in excess of the 120 percent of the original bid estimate at an adjusted unit price of 0.90 times the original unit price. The first 120 percent of the bid estimate quantity will be paid at the original unit price.

B. The foregoing provisions shall be instituted only after it can be accurately determined that the actual contract sum for the project (exclusive of all change orders unrelated to the original scope of work) will be greater than or less than the original contract sum by more than 5 percent. Until such time that this determination can be made, the Contractor will be paid at his base unit price for actual quantities of work performed. No associated adjustments will be made to lump sum items within the original contract sum due to changes in the actual quantities of unit price items and the Contractor shall not be entitled to an adjusted compensation for unit price items that are deleted in their entirety from the actual scope of work performed.

END OF SECTION

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

1. Coordination.
2. Administrative and supervisory personnel.
3. General installation provisions.
4. Cleaning and protection.

B. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

1.03 COORDINATION

A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.

2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.

3. Delivery and processing of submittals.
4. Progress meetings.
5. Project Close-out activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as University's property.

1.04 SUBMITTALS

A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the interrelationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences.

3. Comply with requirements contained in Section "Submittals."

B. Staff Names: Within 10 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure

Work true to line and level. Allow for expansion and building movement.

E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Engineer for final decision.

F. Recheck measurements and dimensions, before starting each installation.

G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Engineer for final decision.

3.02 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Construction activity that produces significant noise, such as the use of pneumatic hammers, shot-blasting, sand blasting, etc., shall only be permitted from the hours of 8:00 am to 5:00 pm.

C. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

D. Limiting Exposures: Supervise construction activities to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading
2. Excessively high or low temperatures
3. Air contamination or pollution
4. Water or ice
5. Solvents
6. Chemicals
7. Puncture
8. Abrasion
9. Heavy traffic
10. Soiling, staining and corrosion
11. Bacteria
12. Combustion
13. Electrical current
14. Unusual wear or other misuse
15. Contact between incompatible materials

16. Destructive testing
17. Misalignment
18. Excessive weathering
19. Unprotected storage
20. Improper shipping or handling
21. Theft
22. Vandalism

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including;

1. Contractor's construction schedule
2. Submittal schedule
3. Daily construction reports
4. Shop Drawings
5. Product Data
6. Material Safety Data Sheets (MSDS)
7. Samples

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors

C. Inspection and test reports are included in Section "Quality Control."

1.03 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. Processing: Allow sufficient review time so that installation will not be delayed as a result

of the time required to process submittals, including time for re-submittals.

a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
b. If an intermediate submittal is necessary, process the same as the initial submittal.
c. Allow two weeks for reprocessing each submittal.
d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken.

a. Project name
b. Date
c. Name and address of Engineer
d. Name and address of Contractor
e. Name and address of subcontractor
F. Name and address of supplier
g. Name of manufacturer
h. Number and title of appropriate Specification Section
i. Drawing number and detail references, as appropriate

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

2. Transmittal Form: Use AIA Document G 810.

1.04 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner prior to Substantial Completion.

B. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.

C. Distribution: Following response to the initial submittal, print and distribute copies to the Engineer,

Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

1.05 SUBMITTAL SCHEDULE

A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.

1. Coordinate submittal schedule with the list of subcontracts, schedule of values, and the list of products as well as the Contractor's construction schedule.

2. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:

a. Scheduled date for the first submittal
b. Related Section number
c. Submittal category
d. Name of subcontractor
e. Description of the part of the Work covered
f. Scheduled date for resubmittal
g. Scheduled date the Engineer's final release or approval

B. Distribution: Following response to initial submittal, print and distribute copies to the Engineer, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.06 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Engineer at weekly intervals:

1. List of subcontractors at the site.
2. Approximate count of personnel at the site.
3. High and low temperatures, general weather conditions.
4. Accidents and unusual events.
5. Meetings and significant decisions.
6. Stoppages, delays, shortages, losses.
7. Meter readings and similar recordings.
8. Emergency procedures.

9. Orders and requests of governing authorities.
10. Change Orders received, implemented.
11. Services connected, disconnected.
12. Equipment or system tests and start-ups.
13. Partial Completions, occupancies.
14. Substantial Completions authorized.

1.07 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. Dimensions
2. Identification of products and materials included
3. Compliance with specified standards
4. Notation of coordination requirements
5. Notation of dimensions established by field measurement
6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48".
7. Initial Submittal: Submit 2 blue- or black-line prints for the Engineer's review; one will be returned.
8. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Engineer for distribution. 2 prints will be retained; the remainder returned.
9. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

1. Preparation of coordination Drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

2. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.08 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, roughing-in diagrams and templates, and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

    a. Manufacturer's printed recommendations
    b. Compliance with recognized trade association standards
    c. Compliance with recognized testing agency standards
    d. Application of testing agency labels and seals
    e. Notation of dimensions verified by field measurement
    f. Notation of coordination requirements

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

4. Submittals: Submit 5 copies of each required submittal. The Engineer will return to the Contractor a marked submittal with action taken and corrections or modifications required.

    a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

    a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

    b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.09 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts, or containers of materials, color range sets, and swatches showing color, texture, and pattern.

    1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Engineer's Sample. Include the following:

        a. Generic description of the Sample
        b. Sample source
        c. Product name or name of manufacturer
        d. Compliance with recognized standards
        e. Availability and delivery time

    2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between

the final submittal and the actual component as delivered and installed.

a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

c. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.

3. Preliminary submittals: Where Samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product. Preliminary submittals will be reviewed and returned with the Engineer's mark indicating selection and other action.

4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

b. Sample sets may be used to obtain final acceptance of the construction Engineer with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.10 ENGINEER'S ACTION

A. Except for submittals for record, information, or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "Accepted," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Final-But-Restricted Release: When submittals are marked "Accepted as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal: When submittal is marked "Not Accepted, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark. Do not permit submittals marked "Not Accepted, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

4. Other Action: Where a submittal is primarily for information or record purposes, special processing, or other activity, the submittal will be returned, marked "Action Not Required."

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 35 29 – SAFETY, HEALTH AND ENVIRONMENT

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section

1.02 SUMMARY

A. References: In addition to publications referenced in the Construction Contract Clauses, the following Code of Federal Regulations (CFR) publications designate and define hazardous materials and conditions, and establish procedures for handling these materials and conditions. Omission of any publication in this section does not remove any obligation or legal requirement on the part of the contractor to comply with all legal requirements for the location of the work.

1. 29 CFR, Part 1910: Occupational Safety and Health Administration (OSHA) General Industry and Health Standards
2. 29 CFR, Part 1926: OSHA Construction Industry Standards.
3. 40 CFR, Part 61: National Emission Standards for Hazardous Air Pollutants.
4. 40 CFR, Part 261: Environmental Protection Agency (EPA) Characteristics of Hazardous Waste.
5. 40 CFR, Part 761: EPA Polychlorinated Biphenyls (PCBs), Manufacturing, Processing, Distribution in Commerce and Use Prohibitions
6. 40 CFR, Part 763: EPA Asbestos.
7. Federal Standards 313A: Material Safety Data Sheets, Preparation and the Submission of.
8. NIH DES Instruction 1340-7: Precautions and Procedures for Entering Manholes or Other Below Grade Confined Spaces.
9. NIH DCAB publication "Standards for Temporary Construction," March 1988.

B. Related Sections: This specification section is related to any and all specification sections with explicit or implicit reference to cutting and patching. Specific submittal requirements of these related specification sections are not included in this section. Related sections include but are not limited to the following specification sections:

1. Division 1 Section 01 11 00 "Summary of Work"
2. Division 1 Section 01 22 00 "Unit Prices"
3. Division 1 Section 01 31 00 "Project Management and Coordination"
4. Division 1 Section 01 33 00 "Submittal Procedures"
5. Division 1 Section 01 42 19 "Reference Standards"
6. Division 1 Section 01 45 00 "Quality Control"
7. Division 1 Section 01 50 00 "Temporary Facilities"
8. Division 1 Section 01 60 00 "Product Requirements"
9. Division 1 Section 01 73 29 "Cutting and Patching"
10. Division 1 Section 01 77 00 "Closeout Procedures"
11. Division 1 Section 01 78 36 "Warranties"
12. Division 2 Section 02 41 16 "Selective Demolition"

C. Hazardous Materials: Some hazardous and toxic materials and substances are included in 29 CFR Part 1910, subparts H and Z, and in 29 CFR Part 1926 and others additionally defined in Federal Standard 313A. Commonly encountered hazardous materials include but are not limited to asbestos, PCBs, explosives and radioactive material.

1. Asbestos may be found in spray-on fireproofing, insulation, boiler lagging, pipe coverings and other materials. See Division 1 Section "Asbestos Abatement" for removal requirements.

2. PCBs may be contained in ballasts, transformers, capacitors, voltage regulators, oil switches, mechanical insulation and other materials.

D. Acquisition of Publications: Referenced CFR publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

1.03 SUBMITTALS

A. Contractor's Safety and Health Program: The contractor shall submit a written copy of the Company Safety and Health Program as well as the site specific safety and health plan for the project to the Owner's Representative within 14 calendar days of the Notice to Proceed or before work commences on the project site, whichever is earlier.

B. Accident Reports: The Contractor must submit to the Owner's Representative a written report within three calendar days of any accident, fire, emergency, theft or incident in which any personal or property damage took place, regardless of any other notifications performed. Include a copy of each accident report that is submitted by the Contractor or Subcontractors to their insurance carriers, within seven calendar days after the date of the accident.

C. Material Safety Data Sheets (MSDS): The contractor shall provide the Material Safety Data Sheets (MSDS's) for all products containing hazardous chemicals to the Owner's Representative within 14 calendar days of the Notice to Proceed or before work commences on the site. The MSDS's shall be maintained at the project site for workers, Owner personnel and government officials. MSDS's for new products shall similarly be submitted to the Owner Representative and be retained at the project site until completion of the project.

1.04 PRECONSTRUCTION SAFETY MEETING

A. Prior to commencing construction, representatives of the Contractor, including the general superintendent and one or more safety representatives, shall meet with the Owner's Representative for the purpose of reviewing Contract safety and health requirements.

1. The Contractor's Safety and Health Program and Site Specific Safety and Health Plan shall be reviewed, and implementation of safety and health provisions pertinent to the Work shall be discussed.

2. The Contractor shall be prepared to discuss, in detail, the Contractor's Site Specific Safety and Health Plan including measures intended to control any unsafe or unhealthy conditions associated with the work to be performed under the contract.

3. This meeting may be held in conjunction with the preconstruction conference, if so directed by the Owner's Representative. The conduct of this meeting is not contingent upon a general preconstruction meeting.

4. The level of detail for the safety meeting is dependent upon the nature of the work and the potential inherent hazards.

1.05 COMPLIANCE WITH REGULATIONS

A. The work, including contact with or handling of hazardous materials, disturbance or dismantling of surfaces containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirements of 29 CFR Parts 1910 and 1926, and 40 CFR Parts 61, 261, 761 and 763.

B. Work involving disturbance or dismantling of asbestos or asbestos containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763.

C. Work shall additionally comply with all applicable state and local safety and health regulations.

D. In case of a conflict between applicable regulations, the more stringent requirements shall apply.

E. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable codes, standards and regulations pertaining to the health and safety of personnel during execution of the Work, and shall hold the Owner harmless for any action on the Contractor's part, or that of the Contractor's employees or subcontractors, that result in illness, injury or death.

1. The Contractor shall have written safety and health programs in compliance with 29 CFR Parts 1910 and 1926.

2. Inspections, Tests, and Reports: The required inspections, tests and reports made by the Contractor, subcontractors, specially trained technicians, equipment manufacturers, and others as required, shall be at the Contractor's expense.

1.06 USE OF EXPLOSIVES AND EXPLOSIVE ACTUATED FASTENING TOOLS

A. Use of explosives shall be prohibited.

B. Explosive actuated fastening tools (ex. nail guns, etc.) shall not be used or brought to the project site without the permission of the Owner's Representative, including a safety plan for the use of this equipment.

1.07 WORK UNDERGROUND OR IN CONFINED SPACES

A. Work underground or in confined spaces shall comply with the NIH Division of Engineering Services Instruction Manual 1340-7, "Precautions and Procedures for Entering Manholes or Other Below Grade Confined Spaces" (DES INST 1340-7). A copy of the instruction may be obtained from the University's Office of Environmental Health and Safety on request.

B. Work shall also comply with appropriate MSHA and OSHA regulations including but not limited to 29 CFR 1910.146 and COMAR 09.12.32B.

C. The Contractor shall remove water and debris and properly vent manholes before commencement and during execution of work in manholes.

1.08 ELECTRICAL

A. Electrical arc welding equipment shall not be connected to the building power supply.

1.09 MATERIAL DELIVERIES

A. Whenever practicable, deliveries shall be made during regular working hours and only when the Contractor's representative is available to receive them. Deliver material in approved containers and with properly licensed vehicles and operators. Open delivery vehicles are not permitted. Deliver materials in fully closed vehicles or tarp-covered vehicles. All dump trucks shall be fully covered while in transport to and from the unloading site. All loads shall be securely fastened until unloading. Engines shall not be left running while vehicles are loading, unloading, waiting or parked. Do not block roads, walks, building entrances/exits, fire hydrants and standpipes, exterior tanks or building gas connections.

1.10 HAZARDOUS MATERIAL

A. The Contractor shall bring to the attention of the Engineer and the Owner's Representative, any material encountered during execution of the Work that the Contractor suspects is hazardous. The Owner's Representative shall have the Office of Environmental Health and Safety perform tests to determine if the material is hazardous.

B. If the tested material is found to be hazardous, and/or if additional protective measures are required, a change to the Contract price may be provided, subject to the applicable provisions of the Contract.

1.11 ADDITIONAL SAFETY REQUIREMENTS

A. No work shall be performed in any area occupied by the public or Owner employees unless approved by the Owner.

1. Accident Treatment and Records: The Contractor shall post emergency first aid information.

2. No person, regardless of position or authority, shall operate any switch, valve, or equipment that has an official lockout/tag out tag attached to it, nor shall such tag be removed except as provided in this section.

3. When work is to be performed on electrical circuits, the work shall be performed only by qualified personnel following the required safety procedures.

4. Identification markings on building light and power distribution circuit breakers shall not be relied on for establishing safe work conditions.

5. Before clearance will be given on any equipment other than electrical (generally referred to as mechanical apparatus), the apparatus, valves, or systems shall be secured in a passive condition with the appropriate vents, pins, and locks.

6. Pressurized or vacuum systems shall be vented to relieve differential pressure completely.

7. Vent valves shall be lockout/tag out tagged open during the course of the work.

8. Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, systems or areas shall be purged, ventilated, or otherwise made safe prior to entry.

1.12 PERSONNEL PROTECTIVE EQUIPMENT

A. Special facilities, devices, equipment and similar items used by the Contractor in execution of the work shall comply with 29 CFR, Part 1910, Subpart 1 and other applicable regulations.

PART 2 – PRODUCTS

2.01 Safety and Health Programs: The Contractor shall submit copies of the written site specific project safety and health plan and emergency action procedures, as applicable to the work scope, as required as a result of the safety meeting, or as required by OSHA 29 CFR, Part 1926 including but not necessarily limited to the procedures and programs that support the requirements of the following:

A. Designation of Safety Competent Person
B. Occupational Noise Exposure
C. Fall Protection
D. Personnel Protective Equipment
E. Control of Hazardous Energy
F. Hazardous Materials Waste Management Plan (draft if final plan has not been accepted)
G. Electrical Safety Related Work Practices
H. Lead
I. Asbestos
J. Respirator Protection
K. Confined spaces
L. Emergency evacuation and reporting
M. Hot Work

2.02 Contractor's Safety and Health Plan: In addition to specific safety and health programs applicable to the project, Contractor shall submit to the Owner a copy of the firms' general Safety and Health Plan listing emergency procedures and contact persons with home addresses and telephone numbers.

2.03 Permits: If hazardous materials are disposed of off-site, submit copies of shipping manifests and permits from applicable federal, state or local authorities and disposal facilities, and submit certificates that the material has been disposed of in accordance with regulations.

PART 3 – EXECUTION

3.01 EMERGENCY SUSPENSION OF WORK

A. When the Contractor is notified by the Engineer or the Owner's Representative, of noncompliance with the safety or health provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe or unhealthy condition.

1. If the Contractor fails to comply promptly, all or part of the work will be stopped by notice form the Engineer.

2. When, in the opinion of and by notice given by the Engineer and or the Owner's Representative, satisfactory corrective action has been taken by the Contractor, work shall resume.

3. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe or unhealthy condition.

3.02 PROTECTION OF PERSONNEL

A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a subcontractor.

B. Wherever practical, the work area shall be fenced, barricaded or otherwise blocked off from the public or occupants to prevent unauthorized entry into the work area.

1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.

2. Corridors, aisles, stairways, doors and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe or unhealthy condition to the public or occupants.
3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupants by accidental shifting, ignition or other hazardous activity.

4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers, and remove refuse on a frequent regular basis acceptable to the Owner's Representative. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks.

C. Alternate Precautions: When the nature of the work prevents isolation of the work area and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the erection of barricades or similar protection around particularly hazardous operations shall be used as appropriate.

D. Public Thoroughfare: When work is to be performed over a public thoroughfare such as a sidewalk, roadway or other site access way, the thoroughfare shall be closed, if possible, or other precautions taken such as the installation of screens or barricades. When the exposure to heavy falling objects exists, as during the erection of building walls or during demolition, special protection of the type detailed in 29 CFR, Parts 1910 and 1926 shall be provided.

3.03 ENVIRONMENTAL PROTECTION

A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

B. Comply with applicable federal, state and local noise control laws, ordinances and regulations, including but not limited to 29 CFR, Part 1910.95 and 29 CFR, Part 1926.52.

END OF SECTION

SECTION 01 42 19 – REFERENCE STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 2004 format.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted. Sd – sdf

a. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

1.03 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with the standard in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Engineer for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are

minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Engineer for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol St., Suite 225
Washington, DC 20001
(202) 624-5800

ACI American Concrete Institute
P.O. Box 19150
Detroit, MI 48219
(313) 532-2600

ACIL American Council of Independent Laboratories
1725 K St., NW
Washington, DC 20006
(202) 887-5872

AI Asphalt Institute
P.O. Box 14052
Lexington, KY 40512
(606) 288-4960

AIA American Institute of Architects
1735 New York Ave., NW
Washington, DC 20006
(202) 626-7300

APA	American Plywood Association P.O. Box 11700 Tacoma, WA 98411 (206) 565-6600
ASC	Adhesive and Sealant Council 1627 K Street, NW, Suite 1000 Washington, DC 20006 (202) 452-1500
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362 (805) 495-7120
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103 (215) 299-5400
AWS	American Welding Society 550 LeJeune Road, NW P.O. Box 351040 Miami, FL 33135 (305) 443-9353
BHMA	Builders' Hardware Manufacturers Association 355 Lexington Ave., 17th Floor New York, NY 10017 (212) 661-4261
BIA	Brick Institute of America 11490 Commerce Park Drive, Suite 300 Reston, VA 22091 (703) 620-0010
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Rd. Schaumburg, IL 60173 (312) 517-1200
EJMA	Expansion Joint Manufacturers Association 25 N. Broadway Tarrytown, NY 10591 (914) 332-0040

HPMA	Hardwood Plywood Manufacturers Association 1825 Michael Farraday Drive P.O. Box 2789 Reston, VA 22090 (703) 435-2900
IEEE	Institute of Electrical and Electronic Engineers 345 E. 47th St. New York, NY 10017 (212) 705-7900
NAPA	National Asphalt Pavement Association Calvert Building, Suite 620 6811 Kenilworth Ave. Riverdale, MD 20737 (301) 779-4880
NCMA	National Concrete Masonry Association P.O. Box 781 Herndon, VA 22070 (703) 435-4900
NEC	National Electric Code (from NFPA)
NECA	National Electrical Contractors Association 7315 Wisconsin Ave. Bethesda, MD 20814 (301) 657-3110
NFPA	National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 (617) 770-3000
NPCA	National Paint and Coatings Association 1500 Rhode Island Ave., NW Washington, DC 20005 (202) 462-6272
PCA	Portland Cement Assoc. 5420 Old Orchard Road Skokie, IL 60077 (312) 966-6200
PDI	Plumbing and Drainage Institute c/o Sol Baker 1106 W. 77th St., South Dr. Indianapolis, IN 46260 (317) 251-6970

RMA Rubber Manufacturers Association
1400 K St., NW
Washington DC 20005
(202) 682-4800

SSPC Steel Structures Painting Council
4400 Fifth Ave.
Pittsburgh, PA 15213
(412) 268-3327

WRI Wire Reinforcement Institute
1760 Reston Parkway, Suite 403
Reston, VA 22090
(703) 790-9790

G. Federal Government Agencies: Names and titles of federal government standard or Specification producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard or Specification producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up to date as of the date of the Contract Documents.

CE Corps of Engineers
(U.S. Department of the Army)
Chief of Engineers - Referral
Washington, DC 20314
(202) 272-0660

CFR Code of Federal Regulations
Available from the Government Printing Office
N. Capitol St. between G and H St. NW
Washington, DC 20402
(202) 783-3238
(Material is usually first published in the "Federal Register")

CPSC Consumer Product Safety Commission
5401 Westbard Ave.
Bethesda, MD 20816
(800) 638-2772

CS Commercial Standard
(U.S. Department of Commerce)
Government Printing Office
Washington, DC 20402
(202) 377-2000

DOC Department of Commerce
14th St. and Constitution Ave., NW
Washington, DC 20230
(202) 377-2000

DOT	Department of Transportation 400 Seventh St., SW Washington, DC 20590 (202) 366-4000
EPA	Environmental Protection Agency 401 M St., SW Washington, DC 20460 (202) 382-2090
FAA	Federal Aviation Administration (U.S. Department of Transportation) 800 Independence Ave., SW Washington, DC 20590 (202) 366-4000
NIST	National Institute of Standards and Technology (U.S. Department of Commerce) Gaithersburg, MD 20899 (301) 975-2000
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) Government Printing Office Washington, DC 20402 (202) 523-6091
PS	Product Standard of NBS (U.S. Department of Commerce) Government Printing Office Washington, DC 20402 (202) 783-3238

1.04 GOVERNING REGULATIONS/AUTHORITIES

A. The Engineer has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.

B. Copies of Regulations: Obtain copies of the applicable regulations and retain at the Project Site, available for reference by parties who have a reasonable need for such reference.

1.05 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Engineer's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 45 00 – QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for quality control services.

B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include contract enforcement activities performed by the Engineer.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.

1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.

2. Inspections, testing, and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.

3. Requirements for the Contractor to provide quality control services required by the Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.03 RESPONSIBILITIES

A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

1. The Contractor shall employ and pay an independent agency, to perform specified quality control services.

2. The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibilities.

a. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and if the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.

3. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

1. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

a. Providing access to the Work and furnishing labor and facilities necessary to facilitate inspections and tests.

b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.

c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.

d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.

e. Security and protection of samples and test equipment at the Project site.

B. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Engineer and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

1. The agency shall notify the Owner, Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

3. The agency shall not perform any duties of the Contractor.

C. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.04 SUBMITTALS:

A. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Engineer, Owner and Contractor.

1. Report Data: Written reports of each inspection, test, or similar service shall include, but not be limited to:

a. Date of issue
b. Project title and number
c. Name, address, and telephone number of testing agency
d. Dates and locations of samples and tests or inspections
e. Names of individuals making the inspection or test
f. Designation of the Work and test method
g. Identification of product and Specification Section
h. Complete inspection or test data
i. Test results and interpretations of test results
j. Ambient conditions at the time of sample-taking and testing
k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
l. Name and signature of laboratory inspector
m. Recommendations on retesting

1.05 QUALITY ASSURANCE

A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the work is to take place.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies. Comply with Contract Document requirements for "Cutting and Patching."

B. Protect construction exposed by or for quality control service activities, and protect repaired construction.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility

for inspection, testing or similar services.

END OF SECTION

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.

B. Temporary utilities required include but are not limited to:

1. Water service and distribution
2. Temporary electric power and light
3. Telephone service

C. Temporary construction and support facilities required include but are not limited to:

1. Temporary heat.
2. Field offices and storage sheds.
3. Sanitary facilities, including drinking water.
4. Temporary enclosures.
5. Temporary Project identification signs and bulletin boards.
6. Waste disposal services.
7. Rodent and pest control.
8. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities required include but are not limited to:

1. Temporary fire protection
2. Barricades, warning signs, lights
3. Sidewalk bridge or enclosure fence for the site
4. Environmental protection

1.03 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

1.04 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities

having jurisdiction, including but not limited to:

1. Building Code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, Fire Department, and Rescue Squad rules
5. Environmental protection regulations

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."

1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide new materials; if acceptable to the Engineer, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Lumber and Plywood:

1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.

2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.

3. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.

4. For safety barriers, sidewalk bridges, and similar uses provide minimum 5/8" thick exterior plywood.

C. Paint: Comply with requirements of Division-9 Section "Painting."

1. For job-built temporary offices, shops, sheds, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.

2. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.

3. For interior walls of temporary offices, provide two coats interior latex flat wall paint.

D. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

E. Water: Provide potable water approved by local health authorities.

F. Mesh Fencing: Provide heavy duty square mesh fencing with maximum 2” x 2” openings 6-feet high with galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts. Secure opaque visual screen to entire length and height of fencing.

2.02 EQUIPMENT

A. General: Provide new equipment; if acceptable to the Engineer, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air- conditioned units on foundations adequate for normal loading.

H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.

I. First Aid Supplies: Comply with governing regulations.

J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.

1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Obtain easements to bring temporary utilities to the site, where the University's easements cannot be used for that purpose.

4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer, and will not be accepted as a basis of claims for a Change Order.

B. Temporary Water Service: The contractor shall make arrangements with the Owner for temporary water from existing sources at the facility. The Contractor shall be responsible for all hoses, connections, etc., required from the point of water source at the facility. The water usage may be metered and billed to the Contractor. Contractor is responsible to contact Owner’s utility services to set it up water usage.

C. Temporary Electric Power Service: The Contractor shall make all arrangements for and shall install and pay for the temporary electric service. The Contractor shall furnish, install and maintain all temporary and power facilities required by the work. Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

1. Power Distribution System: Install wiring overhead, and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, AC 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

D. Temporary Lighting:

1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.

E. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.

1. At each telephone, post a list of important telephone numbers.

F. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner. Weekly EPA reports are required to be filed with FOD/EHS. All fines are the responsibility of the Contractor.

1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.

2. Connect temporary sewers to the municipal system as directed by the sewer department officials.

3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

G. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Locate storage sheds, sanitary facilities and other temporary construction and support facilities for easy access at locations approved by the University.

1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion

will be permitted to use permanent facilities, under conditions acceptable to the University.

B. Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.

C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

D. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.

E. Field Offices: The Contractor will provide and pay for temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings.

F. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site as approved by the Owner.

G. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

1. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.

H. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

I. Drinking Water Facilities: Within temporary office, provide containerized tap-dispenser bottled-water type drinking water units, including paper supply.

J. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.

3. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-

labeled fire-retardant treated material for framing and main sheathing.

K. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

3.04 PROTECTION FACILITIES INSTALLATION

A. Temporary Fire Protection:

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

B. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.

C. Security Enclosure and Lockup:

1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

D. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.05 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.

2. Protection: Prevent water filled piping from freezing.

C. Termination and Removal: Unless the Owner requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of the Contractor.

2. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.

3. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

   a. Replace air filters and clean inside of ductwork and housings.

   b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."

C. Standards: Refer to Section "Reference Standards and Definitions" for applicability of industry standards to products specified.

D. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Product Substitutions."

1.03 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. Note that some product specifications require job specific purchase of the materials versus use from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturers published product literature that is current as of the date of the Contract Documents.

2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.04 SUBMITTALS

A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Engineer. Include generic names of products required. Include the manufacturer's name and

proprietary product names for each item listed.

1. Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.

2. Form: Prepare the product listing schedule with information on each item tabulated under the following column headings:

    a. Related Specification Section number
    b. Generic name used in Contract Documents
    c. Proprietary name, model number, and similar designations
    d. Manufacturer's and name and address
    e. Supplier's name and address
    f. Installer's name and address
    g. Projected delivery date, or time span of delivery period

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

    a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.

4. Completed Schedule: Within 60 days after date of commencement of the Work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

5. Engineer's Action: The Engineer will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Engineer's response will include the following:

    a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.05 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

    1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Engineer for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project; the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

2. Semi-proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

    a. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.

    a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

6. Compliance with Standards, Codes, and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

7. Visual Matching: Where Specifications require matching an established Sample, the Engineer's decision will be final on whether a proposed product matches satisfactorily.

    a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

8. Visual Selection: Where specified product requirements include the phrase"...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Engineer will select the color, pattern and texture from the product line selected.

9. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division-1 for allowances that control product selection, and for procedures required for processing such selections.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS:

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated.

1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to existing plumbing and electrical installations.

C. Demolition of selected portions of the building for alterations is included in Section "Selective Demolition."

1.03 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the structure's appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching is to be performed.

5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and Engineer’s calculations to show how reinforcement is integrated with the original structure.

7. Approval by the Engineer to proceed with cutting and patching does not waive the Engineer's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.04 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

a. Foundation construction
b. Bearing and retaining walls
c. Structural concrete
d. Structural steel
e. Lintels
f. Timber and primary wood framing
g. Structural decking
h. Stair systems
i. Miscellaneous structural metals
j. Exterior curtain wall construction
k. Equipment supports
l. Piping, ductwork, vessels, and equipment

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

a. Shoring, bracing, and sheeting
b. Primary operational systems and equipment
c. Air or smoke barriers
d. Water, moisture, or vapor barriers
e. Membranes and flashings
f. Fire protection systems
g. Noise and vibration control elements and systems
h. Control systems
i. Communication systems
j. Conveying systems
k. Electrical wiring systems

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Engineer's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. If possible retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:

a. Processed concrete finishes.
b. Stonework and stone masonry.

c. Ornamental metal.
d. Matched-veneer woodwork.
e. Preformed metal panels.
f. Window wall system.
g. Stucco and ornamental plaster.
h. Acoustical ceilings.
i. Terrazzo.
j. Finished wood flooring.
k. Fluid-applied flooring.
l. Carpeting.
m. Aggregate wall coating.
n. Wall covering.
o. Swimming pool finishes.
p. HVAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.01 INSPECTION

A. Before cutting existing surfaces examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with parties involved in cutting and patching. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

4. Patch or repair existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.04 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 77 00 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures
2. Project record document submittal
3. Operating and maintenance manual submittal
4. Submittal of warranties
5. Final cleaning

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 9.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

2. Advise Owner of pending insurance change-over requirements.

3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates, and similar releases.

5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.

6. Deliver tools, spare parts, extra stock, and similar items.

7. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.

8. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

9. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Engineer will repeat inspection when requested and assured that the Work has been substantially completed.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List any exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the Engineer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.

5. Submit consent of surety to final payment.

6. Submit a final liquidated damages settlement statement.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Engineer.

1. Upon completion of reinspection, the Engineer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

1.05 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.

4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit complete set of record Product Data to the Engineer for the Owner's records.

E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Engineer and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Engineer for the Owner's records.

G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information – submit at least three copies. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions
2. Spare parts list
3. Copies of warranties
4. Wiring diagrams
5. Recommended "turn around" cycles
6. Inspection procedures
7. Shop Drawings and Product Data
8. Fixture lamping schedule

H. The Engineer will compile all Record Documents and submit to the Owner as one submittal. Record Documents will be in both electronic and hard copy format.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
4. Tools
5. Lubricants
6. Fuels
7. Identification systems

8. Control sequences
9. Hazards
10. Cleaning
11. Warranties and bonds
12. Maintenance agreements and similar continuing commitments

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up
2. Shutdown
3. Emergency operations
4. Noise and vibration adjustments
5. Safety procedures
6. Economy and efficiency adjustments
7. Effective energy utilization

3.02 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

1. Remove labels that are not permanent labels.

2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

5. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove

waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

SECTION 01 78 36 – WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.

2. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Divisions 2 through 9.

3. Certifications and other commitments and agreements for continuing services to the Owner are specified elsewhere in the Contract Documents.

B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.03 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.04 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding; reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or

rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.05 SUBMITTALS

A. Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Engineer.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.

C. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer. Submit a draft to the Owner through the Engineer for approval prior to final execution.

1. Refer to individual Sections of Divisions 2 through 9 for specific content requirements, and particular requirements for submittal of special warranties.

D. Form of Submittal: At Final Completion compile three copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

E. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.

3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 SCHEDULE OF WARRANTIES

A. Schedule: Provide warranties on products and installations as specified below:

1. The General Contractor shall provide a 5-year warranty for all repairs performed to conform to the specifications in the form of Specification Section 00 65 36 Certificate of Five-Year Corrective Period, in addition to specific warranties for individual products listed below:

2. Concrete (Division 03): The general contractor shall provide a 5-year warranty for quality workmanship and materials to conform to specifications.

3. Thermal and Moisture Protection (Division 07): The general contractor shall provide a 5-year warranty against leaking or failure under normal vehicular traffic for the expansion joint systems (Specification Section 07 91 00), all joint sealants (Specification Section 07 92 13), and the waterproofing system.

END OF SECTION

DIVISION 2

EXISTING CONDITIONS

SECTION 02 41 16 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Description

1. Furnish labor, materials, equipment, and transportation necessary to do all concrete demolition, as shown on drawings and as specified herein, including but not necessarily limited to the following:

   a. Removal of existing deteriorated concrete as directed by the Engineer.
   b. Dust and water control.
   c. Removal and disposal of all debris.
   d. Disconnecting and relocating/reinstalling any existing utility lines on the site which interferes with the repairs.
   e. Protection of all existing electrical systems, mechanical equipment, light fixtures, overhead piping, fire protection system etc. scheduled to remain.

2. Contractor shall provide barricades with warning lights, enclose the construction area and take all precautions necessary to ensure public and employee safety.

3. All work shall be done in accordance with the requirements of all local and state agencies.

B. Quality Assurance

1. Demolition Contractor's Qualifications: Minimum of 5 years experience on comparable projects.

2. Comply with all pertinent codes and regulations which apply to this type of work and with requirements of insurance carriers providing coverage for this work. Dispose of debris in a legal manner off site daily. Do not allow to accumulate on site.

C. Job Conditions

1. Dust and Water Control: Contractor shall contain particular debris generated by his work activities from polluting the atmosphere or waterways.

2. On-site burning shall not be permitted.

3. Use all means necessary to protect existing facilities, utilities, and appurtenances within the project areas.

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Submit schedule indicating proposed sequence of operations for selective demolition work to the Owner and Engineer for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

2. Coordinate with Owner’s continuing use of portions of existing building.

C. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner’s Representative prior to start of work.

1.04 JOB CONDITIONS

A. Occupancy: Conduct selective demolition work in manner that will minimize need for disruption of Owner's continuing operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's continuing operations.

B. Condition of Structures: The Owner assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, minor variations within structure may occur prior to start of selective demolition work.

C. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

1. Storage or sale of removed items on site will not be permitted.

D. Protections: Provide temporary barricades and other forms of protection to protect the Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of the project.

2. Erect temporary covered passageways as required by authorities having jurisdiction.

3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.

4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

5. Protect floors with suitable coverings when necessary.

6. Construct temporary insulated dust resistant partitions where required separating areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dust resistant doors and security locks.

7. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.

8. Remove protections at completion of work.

E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.

F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

H. Utility Services: Maintain existing utilities in service and protect them against damage during demolition operations.

1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

2. Maintain fire protection services during selective demolition operations.

I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Use appropriate materials and proper equipment to complete the work of this Section. Provide all necessary barricades, warning devices, enclosures, etc. as required to comply with governing safety regulations.

PART 3 - EXECUTION

3.01 PREPARATION

A. General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.

1. Cease operations and notify Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

2. Cover and protect equipment and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.

3. Erect and maintain dust resistant partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

a. Where selective demolition occurs immediately adjacent to occupied portions of the building or temporary passageways, drive aisles, and parking spaces, construct dust resistant partitions of minimum 4-inch studs and ½-inch fire-retardant plywood on demolition side.

b. Provide weatherproof closures for exterior openings resulting from demolition work.

4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain due to abandonment or new system installation.

B. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during demolition or changeover.

3.02 DEMOLITION

A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

1. Demolish concrete in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.

2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.

3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit a

report to the Engineer, written in accurate detail. Pending receipt of a directive from the Engineer, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.03 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove from site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

2. Burning of removed materials is not permitted on project site.

3.04 CLEANUP AND REPAIR

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site.

1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03 10 00 – CONCRETE FORMWORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide formwork for concrete repairs as indicated on the Drawings and specified herein.

B. Work includes formwork and shoring for concrete repairs, and installation into formwork of items such as anchor bolts, anchorages, inserts, and other items to be embedded in concrete.

1.02 QUALITY ASSURANCE

A. Reference Standards:

1. American Concrete Institute (ACI):
347: Recommended Practice for Concrete Formwork

2. American National Standards Institute (ANSI):
A199: Construction and Industrial Plywood

B. Allowable Tolerances:

1. Construction formwork to provide completed cast-in-place concrete structures complying with the tolerances specified in ACI 347.

2. Before concrete placement check the lines and levels of erected formwork. Make corrections and adjustments to ensure proper size and locations of concrete members and stability of forming systems.

3. During concrete placement check formwork and related supports to ensure that forms are not displaced and that completed work will be within specified tolerances.

1.03 SUBMITTALS

A. Manufacturer's Data:

1. Submit manufacturer's data and installation instructions for materials including form coatings, manufactured form systems, ties and accessories.

B. Shop Drawings:

1. Submit shop drawings for fabrication and erection of formwork for finished concrete surfaces. Show the general construction of forms including jointing, special formed joints for reveals, location and pattern of form tie placement, and other items which affect the exposed concrete visually.

2. Design of formwork & shoring for structural stability and sufficiency is the Contractor's responsibility.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Forms for Exposed Finish Concrete:

1. Unless otherwise shown or specified, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood-faced or other panel type materials acceptable to the Engineer, to provide continuous, straight, smooth as-cast surfaces. Furnish in largest practicable sizes to minimize number of joints. Forms shall be mortar-tight, sufficiently rigid to prevent distortion due to the wet concrete mix and other loads incident to construction operations, including vibration, and so constructed and maintained to prevent warping and opening of the joints due to shrinkage of the form material. Molding strips shall be placed in the corners of forms so as to produce beveled edges on permanently exposed concrete corners.

a. Plywood Forms: Use overlaid plywood complying with ANSI A 199.1, B-High Density Concrete Form Overlay, Class I.

B. Forms for Concrete Not Exposed:

1. Form concrete surfaces which will not be exposed in the finished structure with plywood, lumber, metal, or other acceptable material. Use lumber that is dressed on at least 2 edges and 1 side for tight fit.

C. Form Ties:

1. Use factory-fabricated, adjustable-length, removable or snap off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

2. Unless otherwise shown, use ties so that portion remaining within concrete after removal of exterior parts is at least 1 inch from the outer concrete surface. Unless otherwise shown, use form ties which will not leave a hole larger than 1 inch diameter in the concrete surface.

3. For exposed finish concrete, use plastic cones and coil ties where indicated on the drawings.

D. Forms Coating:

1. Use commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

a. Coat forms for exposed finish concrete with a co-polymer resin compound equal to nox-Crete "Pre-Form" Concrete Form Sealer.

b. Provide a release agent equal to Nox-Crete "Form Coating".

E. Metal Inserts:

1. Use metal insets for anchorage of materials or equipment to concrete construction as required for the work.

2. Use threaded inserts of malleable cast iron, furnished complete with full-depth bolts; 3/4 inch bolt size, unless otherwise shown.

2.02 DESIGN OF FORMWORK

A. Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure. Carry vertical and lateral loads to ground by formwork system and in place construction that has attained adequate strength for that purpose.

B. Support form facing materials by structural members spaced sufficiently close to prevent deflection. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities and within allowable tolerances.

C. Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

D. Use shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations, using wedges or jacks or a combination thereof. Use trussed supports when adequate foundations for shores and struts cannot be secured.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine the conditions under which concrete formwork is to be erected. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 FORM CONSTRUCTION

A. Construct forms to be the exact sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, levels, and plumb work in finish structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustifications, reglets, chamfers, blocking screeds, bulkheads, anchorage's and inserts, and other features required. Use selected materials to obtain required finishes.

B. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Use crush plates or wrecking plates where stripping may damage cast concrete surfaces. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and assure ease of removal.

C. Provide temporary openings where interior area of formwork is inaccessible for clean out, for inspection before concrete placement, and for placement of concrete. Brace temporary closures and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms in as inconspicuous location as possible; consistent with project requirements.

D. Construct formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.

E. Falsework:

1. Erect falsework and support, brace, and maintain it to safely support vertical, lateral, and asymmetrical loads applied until such loads can be supported by in-place concrete structures. Construct falsework so that adjustments can be made for take-up and settlement.

2. Use wedges, jacks or camber strips to facilitate vertical adjustments. Carefully inspect falsework and formwork during and after concrete placement operations to determine abnormal deflection or signs of failure; make necessary adjustments to produce work of required dimensions.

F. Forms for Exposed Concrete:

1. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes.

2. Do not use metal cover plates for patching holes or defects in forms.

3. Provide chamfered corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, intersections.

4. Use extra studs, walers, and bracing to prevent bowing of forms between studs and to avoid bowed appearance in concrete.

5. Place ties and spreaders symmetrically in plumb tiers and level rows.

6. Place pouring strips in the forms wherever horizontal construction joints are made.

7. Assemble forms so they may be readily removed without damage to exposed concrete surfaces.

8. Form molding shapes, recesses and projections with smooth-finish materials, and install in forms with sealed joints to prevent displacement.

G. Corner Treatment:

1. Form exposed corners to produce smooth, solid, unbroken lines, except as otherwise shown.

2. Form chamfers with 3/4 inch x 3/4 inch strips unless otherwise noted. Extend terminal edges to required limit and miter chamfer strips at changes in direction.

3. Unexposed corners may be formed either square or chamfered.

H. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure units to support types of screeds required.

I. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of others. Accurately place and securely support items to be built into forms.

J. Cleaning and Tightening:

1. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is to be placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

3.03 FORM COATINGS

A. Apply coating to form surfaces, for exposed finish concrete, with form coating compound to provide a smooth glossy form surface. Apply material and cure panels in compliance with manufacturer's instructions.

B. Prior to each concrete pour, treat form surfaces with a suitable release agent. Do not allow excess material to accumulate in the forms or to come into contact with surfaces which will be bonded to fresh concrete.

3.04 INSTALLATION OF EMBEDDED ITEMS

A. General: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of the items to be attached thereto.

3.05 SHORES AND RESHORES

A. Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified.

B. Space out shoring in such a manner that no floor or member will be excessively loaded or will induce stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums if required to ensure the proper distribution of loads throughout the structure.

C. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support the work without excessive stress or deflection.

3.06 REMOVAL OF FORMS

A. Formwork not supporting concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F. for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operation, and provided that curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, roof slabs and other structural elements shall not be removed until concrete has attained a minimum compressive strength of 4,000 psi or 80% of its design compressive strength.

3.07 RE-USE OF FORMS

A. Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces, except as acceptable to the Engineer.

END OF SECTION

SECTION 03 20 00 – CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 DESCRIPTION

A. Furnish, fabricate and install reinforcement and associated items required or indicated on the drawings for concrete repairs, including, but not necessarily limited to, conventional and epoxy-coated bars, welded wire fabric, ties, and supports.

1.03 WORK SPECIFIED ELSEWHERE

A. Furnishing and placement of inserts, anchorages, and other embedded items as specified in other sections.

1.04 QUALITY ASSURANCE

A. Unless otherwise shown or specified, fabrication and placement of all concrete reinforcement and related items shall conform to the following codes and standards:

1. American Concrete Institute, ACI 318, "Building Code Requirements for Reinforced Concrete."

2. American Concrete Institute, ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures."

3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice."

1.05 SUBMITTALS

A. Shop Drawings: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures." Show bar schedule, stirrup spacing, diagrams of bent bars, arrangements, and assemblies, for the fabrication and placement of concrete reinforcement.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver reinforcement to the Project Site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.

Protection: Use all means necessary to protect concrete reinforcement before, during, and after installation and to protect the materials and installed work of all trades. Take all necessary precautions to maintain identification of fabricated bars after bundles are broken.

Storage: Store concrete reinforcement materials at the site to prevent damage and accumulation of dirt or excessive rust. Epoxy-coated reinforcing bars shall be stored on protective cribbing.

Epoxy-coated reinforcing bars: Coating damage due to handling, shipment and placing need not be repaired where the damaged area is 0.1 square inches or smaller; damaged areas larger than 0.1 square inches shall be repaired with Section 2.01 C; the maximum amount of damage including repaired and unrepaired areas shall not exceed 2 percent of the surface area of each bar.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Reinforcing Bars: ASTM A615, Grade 60, deformed.

B. Weldable Reinforcing Bars: ASTM A706, Grade 60, deformed.

C. Welded Wire Fabric: ASTM A82 and ASTM A185.

D. Epoxy-Coated Reinforcing Bars: ASTM A775. When required, damaged epoxy coating shall be repaired with patching material conforming to ASTM A775 and done in accordance with the material manufacturer's recommendations. Reinforcing bars to be coated shall conform to Section 2.01-A.

E. Bar Supports: Bar supports and spacing of same shall be per recommendations set forth by Chapter 3 of the "CRSI Manual of Standard Practice." Epoxy coated reinforcing bars supported from formwork shall rest on coated wire bar supports, or on bar supports made of dielectric material or other acceptable materials. Wire bar supports shall be coated with dielectric material, compatible with concrete, for a minimum distance of 2 inches from the point of contact with epoxy-coated reinforcing bars. Reinforcing bars used as support bars shall be epoxy-coated.

F. Tie Wire: Wire shall be 16 gauge or heavier, black-annealed. Epoxy-coated reinforcing bars shall be tied with plastic coated, epoxy coated, or nylon-coated tie wire or other acceptable materials.

G. For reinforcing steel dowels, use the "Hilti HIT Injection Adhesive Anchor System" supplied by Hilti Fastening Systems, or approved equal. Follow manufacturer's directions for installation and required surface preparation.

2.02 FABRICATION

A. General Requirements: Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication to tolerances complying with CRSI Manual of Standard Practice. In case of fabricating errors, do not rebend or straighten reinforcement in a manner that will injure or weaken the material.

B. Unacceptable Workmanship: Reinforcement with any of the following defects will not be permitted in the work:

1. Bar lengths, depths, and bends exceeding specified fabrication tolerances.

2. Bends or kinks not indicated on drawings or final shop drawings.

3. Bars with reduced cross-section due to excessive rusting or other cause.

C. When epoxy-coated reinforcing bars are cut in the field, the ends of the bars shall be coated with the same material used for repair of coating damage.

PART 3 - EXECUTION

3.01 PLACING REINFORCEMENT

A. General Requirements:

1. All reinforcing bars shall be placed in accordance with CRSI "Recommended Practice for Placing Reinforcing Bars."

2. Bars shall be placed to the tolerance specified in ACI 318.

3. Place all reinforcement according to the approved placement drawings. Use sufficient bar supports, tie anchors, additional reinforcing bars, if required, and other accessories to hold all bars securely in place.

B. Concrete Coverage: Place reinforcement to obtain the minimum coverages specified on the drawings for concrete protection. Arrange, space, and securely tie bars and bar supports together with 16 gauge wire to hold reinforcement accurately in position during concrete placement operation. Set wire ties so that twisted ends are directed away from exposed concrete surfaces.

C. Cleaning Reinforcement: Steel reinforcement, at the time concrete is placed around it, shall be free from loose rust and mill scale, oil, grease, paint, earth, ice and all coatings, which would reduce or destroy bond between steel and concrete. Clean reinforcement as necessary prior to, during, or after placement to achieve this result. When bars project from construction joints, all cement mortar clinging to the bars from previous concreting shall be removed before the ensuing enveloping concrete is placed.

3.02 REINFORCING BAR LAP SPLICES

A. New slab reinforcing bars may be spliced to existing bars by lapped splices if adequate lengths of exposed existing bars are available. Provide reinforcement lap splices by placing bars in contact and tying with wire tightly. Comply with the requirements of ACI 318, latest edition, for minimum required length of bar for lap splices. Alternatively, the contractor can follow the values provided below for lap splice lengths based on the following guidelines:

LAP SPLICE LENGTHS FOR BARS IN TENSION (IN INCHES)

Bar Size	Uncoated Reinforcement	Epoxy-Coated Reinforcement
3	17	25
4	22	33
5	28	41
6	33	50
7	48	72
8	55	83
9	62	93

Note: 1. Based on Class B splice = 1.3 ld (ld = tensile development length)
Normal weight concrete
f'c= 5,000 psi min.
Grade 60 reinforcement

Note: 2. Lap splice lengths for epoxy-coated steel based on clear concrete cover equal to or greater than 1 bar diameter and clear spacing between bars equal to or greater than 2 bar diameters.

B. Do not make splices at points of maximum stress if possible. Consult Engineer if needed to determine best possible splice locations.

C. Stagger all splices, and in horizontal wall reinforcement separate at least five feet longitudinally in alternate bars of opposite tiers.

D. Stubs and dowels required to receive and engage subsequent work shall extend a sufficient length to develop the strength of the bar according to the table in section 3.02.A. Place dowel and stub bars in the forms and secure against displacement during the placing of concrete. Where stub steel and dowels extend through construction joints in walls, they shall be thoroughly cleaned of adhering particles of concrete, before continuing the placing of any subsequent concrete.

E. Where development length is insufficient, either additional concrete removal or mechanical bar splicing shall be implemented at the direction of the Engineer.

3.03 REINFORCING BAR MECHANICAL SPLICES

A. Bars to be spliced by the mechanical splicing process shall be free of paint, oil, rust, scale or other foreign material. The splice shall be done in accordance with the manufacturer's recommendations which shall be submitted to the Engineer for approval.

The mechanical splice shall meet full tension requirement of 100% of the yield strength (fy). The mechanical splices shall be performed using the Quick Wedge system manufactured by Erico Products, Inc. (800)248-2677, MBT Bar Lock System (800) 755-4888, or approved equal.

Test assemblies shall include the same bars, couplers and anchors. The same equipment shall be used to make these assemblies as to be used on the project.

B. Unskilled operators must be trained and indoctrinated by an authorized representative of the system manufacturer. Upon satisfactory completion of the training, a certificate will be issued by the system manufacturer to show the splicer's name, badge, number/Social Security Number and date certified.

C. Test splices should be made on the size, type and grade of rebar to be used in production. If a change of size, type of grade or rebar occurs, new test results should be obtained.

Minimum rebar deformation heights and spacing within the splice must conform to the requirements of ASTM A625, or ASTM A706 as appropriate. If minimum deformation heights and spacing requirements cannot be satisfied, the system's manufacturer may at its option offer and get an approval for alternate splicing procedure to meet the specified splicing strength requirements.

D. The frequency of test splices shall be as follows:

First Fifty (50) - One Test
Next Fifty (50) - One Test
Thereafter, every one hundred (100) - One Test

The test splice shall be a SISTER SPLICE (removable splice made in-place and in sequence adjacent to production splices by the same operator and under same conditions.)

E. If any splice used for testing fails to meet the design code strength requirements, two splices in-place shall be cut from the previous lot and tested. If these sister splices fail, the contractor shall at his own expense, test as many splices as directed by the Engineer and re-splice all test and failed splices.

END OF SECTION

SECTION 03 24 00 – FIBROUS REINFORCEMENT IN CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SCOPE OF WORK

A. All concrete work used in this project shall be fiber reinforced as specified herein.

1.03 STANDARDS

A. Testing:

1. Slump - Perform conventional slump test in accordance with ASTM C143 prior to adding the fibrous reinforcement.

2. Test Specimens - Fiber-reinforced concrete test specimens prepared for quality control/material acceptance shall be vibrated externally as opposed to internal rodding per the recommendations of ACI 544.

B. Submittals:

1. Sufficient data shall be submitted verifying all fibrous reinforcement physical properties as specified in Section 2.01.C inert polypropylene, twisted fibrillated bundles, length, specific gravity, modulus of elasticity, tensile strength as well as volume used as specified.

2. Acceptable submittals shall be manufacturer's Sweets Engineering Catalogue and/or C.S.I. Spec-Data covering all data as specified.

C. Acceptable Manufacturers:

1. “FORTA CR” as manufactured by the FORTA Corporation.

2. “FIBERMESH” as manufactured by Master Builders Technologies.

3. “Grace Microfiber” as manufactured by Grace Construction Products.

PART 2 - PRODUCTS

2.01 MATERIAL

A. General Description - Synthetic fibrous reinforcement shall be used as secondary/temperature reinforcement in the Portland cement concrete.

B. Areas of Use - Fibrous reinforcement to be used in new ready-mixed concrete.

C. Physical Properties

1. Chemical: Fibrous reinforcement shall be chemically and alkali inert, virgin polypropylene.

2. Configuration: Fibrous reinforcement shall be in collated fibrillated (connected screen) form and also in twisted bundle form.

3. Length: The fibrous bundle length shall be a minimum of 0.75".

4. Specific Gravity: 0.91

5. Modulus of Elasticity: 0.70E6 psi

6. Tensile Strength: 70,000 psi minimum

PART 3 - EXECUTION

3.01 INSTALLATION

A. Volume - The fibrous reinforcement shall be used at the rate of 1.5 pounds (minimum) per cubic yard of concrete.

B. Addition and Mixing - The fibrous reinforcement shall be added directly into the concrete either at the batch plant or at the job site. If added at the batch plant with the aggregates, typically no additional site mixing time is required. If a superplasticizer is used, the fibrous reinforcement shall be added first. If the mixing drum contains less than 50% of capacity (i.e. 4 cubic yards in a 10 cubic yard capacity drum), back the concrete up to the top of discharge and empty the fibrous reinforcement directly on top of the concrete before mixing.

C. Placement - Fibrous reinforced concrete shall be moved and placed per standard ACI recommendations. Tined rakes are prohibited as a means of moving the fibrous concrete.

D. Finishing - Standard ACI recommended finishing practices apply for fibrous concrete with the following additional considerations:

1. Hard-Trowel Finish - Avoid Wood trowels and floats which are abrasive to the surface - use steel/magnesium tools.

2. Textured Finish - use stiff-bristled broom (bristles stiffer than the fibers themselves) and brush in only one direction.

3. Cure and joint properly per ACI standard recommendations.

E. It should be noted that fibrous reinforced concrete bleeds less and slightly slower than unreinforced concrete which should be considered during the finishing process.

END OF SECTION

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies cast-in-place concrete, including formwork, mix design, placement procedures, and finishes.

1.03 SCOPE OF WORK

A. This work shall consist of full/partial depth removal of concrete slabs at locations indicated on the drawings using approved methods. New, low water-cementitious materials ratio, fiber-reinforced, air-entrained structural concrete is to be placed according to the Specifications.

1.04 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for proprietary materials and items, including forming accessories, admixtures, patching compounds, bonding grout/agent, joint systems, curing compounds, and others as requested by the Engineer.

C. The Contractor shall submit trial mix proportion with compressive strength test results to the Engineer for approval.

D. The Testing Agency shall submit test results of cylinders for each day's testing.

E. The Contractor shall submit the proposed pouring sequence and construction joint layout for approval by the Engineer.

F. Minutes of pre-construction conference.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. ACI 318, "Building Code Requirements for Structural Concrete," or AASHTO specifications.

B. Materials and installed work may require testing and retesting at any time during progress of work. Retesting of rejected materials for installed work, shall be done at Contractor's expense.

C. Pre-Construction Conference: Conduct conference at Project site to comply with requirements of

Division 1 Section 01 33 00 – Submittal Procedures, and Section 01 45 00 - Quality Control.

D. At the onset of the project start or at least 30 days prior to the first concrete pour, the contractor shall conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures necessary to achieve the required concrete quality. The meeting will review requirements for submittals, status of coordinating work, and availability of materials. It will also establish preliminary work progress schedule and procedures for materials inspection, testing, and certifications. Representatives of each entity directly concerned with cast-in-place concrete should attend the meeting, including, but not limited to, the following:

1. Contractor's superintendent
2. Laboratory responsible for concrete design mixes
3. Laboratory responsible for field quality control
4. Ready-mix concrete producer
5. Concrete subcontractor, if any
6. Primary admixture manufacturers
7. Engineer or Owner's representative

The minutes shall include a statement by the concrete contractor indicating that the proposed mix design and placing techniques will produce the concrete quality required by these specifications.

E. Placement of concrete during cold weather is to be in accordance with the latest version ACI 306. Cold weather concreting is required when a period for more than three successive days the average daily air temperature drops below 40 degrees Fahrenheit and stays below 50 degrees Fahrenheit for more than one-half of any 24 hour period.

1.06 APPLICATOR'S QUALIFICATIONS

A. The Contractor shall have a minimum of five years of experience in performing work similar to that shown in the drawings and specifications.

B. The Contractor may be requested to submit a list of five projects in which similar work to that specified was successfully completed. This list shall contain the following for each of the five projects.

1. Project Name
2. Owner of Project
3. Owner's Representative, Address and Telephone Number
4. Brief Description of Work
5. Cost of Portion of Work Similar to that Specified in this Section
6. Total Restoration Cost of Project
7. Date of Completion

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Forms for Exposed Finish Concrete: N/A

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material.

Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.

1. Provide ties that, when removed, will leave holes not larger than 1-inch diameter in concrete surface.

2.02 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I, non air-entraining, of recent manufacture and free of lumps.

1. Use one brand of cement throughout project unless otherwise acceptable to Engineer.

2. Pozzolanic materials (fly ash or slag) may be substituted for a portion of the cement when reviewed and approved by the Engineer or Owner's representative. Submittals must indicate testing to prove its suitability in combination with the intended cement and aggregate.

3. Additional, sustained moist curing of the concrete is required when pozzolans are used.

B. Normal Weight Aggregates: ASTM C-33 and as herein specified. Provide aggregates from a single source for exposed concrete. Coarse aggregates shall be clean, sound crushed stone or crushed gravel. Maximum size of coarse aggregate shall be 3/4 inch. No chert shall be permitted.

C. Water: Potable water.

D. Sand: ASTM C-33. Sand shall be clean and sharp.

E. Admixtures, General: Provide admixtures for concrete that are free from chloride ions.

F. Air-Entraining Admixture: ASTM C-260, certified by manufacturer to be compatible with other required admixtures.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

a. "Air-Mix" or "AEA-92," Euclid Chemical Co.
b. "Darex AEA" or "Daravair," W.R. Grace & Co.
c. "MB-VR" or "Micro-Air," Master Builders, Inc.
d. "Sealtight AEA," W.R. Meadows, Inc.
e. "Sika AER," Sika Corp.

G. Water-Reducing Admixture: ASTM C 494, Type A.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

   a. "Eucon WR-75," "WAR-91" or "Eucon MR," Euclid Chemical Co.
   b. "WRDA with Hycol," or "Daracem 65," W.R. Grace & Co.
   c. "Pozzolith 322" or "Polyheed 997," Master Builders, Inc.
   d. "Plastocrete 161," Sika Corp.

H. High-Range Water-Reducing Admixture (Super Plasticizer):
ASTM C 494, Type F or Type G.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

   a. "Eucon 37," "Eucon 1037," or "Plastol 5000," Euclid Chemical Co.
   b. "WRDA 19" or "Daracem 100," W.R. Grace & Co.
   c. "Rheobuild 1000," Master Builders, Inc.
   d. "Sikament 300," Sika Corp.

I. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

   a. "Eucon Retarder 75," Euclid Chemical Co.
   b. "Daratard-17," W.R. Grace & Co.
   d. "Pozzolith 100XR," Master Builders, Inc.
   e. "Plastiment," Sika Corporation.

J. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of admixtures will be required from the admixture manufacturer prior to mix design review by the Associate.

K. Fibrous Reinforcement:

1. Subject to compliance with requirements, provide fibrous reinforcement as per specification Section 03 24 00.

2.03 RELATED MATERIALS

A. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, fill reglet or cover face opening to prevent intrusion of concrete or debris.

B. Moisture-Retaining Cover: Burlap and plastic complying with ASTM C 171.

C. Moist Curing: Curing shall be accomplished by wet curing only. A curing membrane shall only be used in floor areas if approved in writing by the Engineer or Owner's representative.

D. Liquid Curing and Sealing Compound (VOC compliant, 350 g/l): The compound shall have 30% solids content minimum and will have a maximum moisture loss of 0.039 grams/sq. cm. when applied at a coverage rate of 250 sq. ft./gallon. Product shall be "Super Aqua-Cure VOX," or "Super Diamond Clear VOX" by the Euclid Chemical Co.

or

Curing and Sealing Compound (VOC compliant, 700 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class B, 25% solids content minimum. Moisture loss shall be not more than 0.30 Kg/sq. m. when applied at 300 sq. ft./gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products: "Super Rez Seal" by the Euclid Chemical Company, "Masterseal 30" by Master Builders or "Kure N Seal 30" by Sonneborn.

2.04 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for concrete by laboratory trial batch or field experience methods as specified in ACI 301, Section 4.2.3. Use an independent testing facility acceptable to the Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

B. Submit written reports to the Engineer of each proposed mix at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed and approved by the Engineer. All mix designs shall be submitted on a Mix Design Submittal Form.

C. Design mix to provide structural concrete with the following properties;

1. 5000-psi, 28-day compressive strength, structural normal or lightweight (to match existing concrete); W/C ratio, 0.38 maximum; fiber reinforcement as per Section 03 24 00.

2.05 ADMIXTURES

A. Use high-range water-reducing admixture (Superplasticizer) in concrete for placement and workability.

B. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6.0% with a tolerance of plus or minus 1.0 percent.

C. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. 3" ± ½" prior to addition of superplasticizing admixture.
2. Not more than 8" final slump after addition of superplasticizing admixture.

2.06 CONCRETE MIXING

A. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.

B. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as specified.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01. PREPARATION

A. Remove concrete members as indicated on the drawing. The removal of concrete shall be performed using approved methods and prepare the concrete surfaces to receive new concrete as shown on plans and as directed by the Engineer in the field.

3.02 FORMS

A. General:

1. The Contractor shall submit detailed drawings for form work for examination by the Engineer. If such drawings are not satisfactory to the Engineer, the Contractor shall make such changes in them as may be required, but it is understood that the Engineer's examination of the drawings as submitted or corrected shall in no way relieve the Contractor of responsibility for obtaining satisfactory results.

2. All forms shall be so constructed and maintained that the finished concrete will be true to line and grade and of the shape and dimensions shown on the Plans. The forms shall be constructed so that they can be removed without injury to the concrete.

3. Forms shall be mortar-tight, sufficiently rigid to prevent distortion due to the wet concrete mix and other loads incident to construction operations, including vibration, and so constructed and maintained to prevent warping and opening of the joints due to shrinkage of the form material. Molding strips shall be placed in the corners of forms so as to produce beveled edges on permanently exposed concrete corners.

4. The interior of forms shall be treated with non-staining form oil before concrete is placed to prevent adhesion of the concrete to the form.

5. All lumber in contact with concrete shall be free from knot holes, loose knots, cracks, splits, warps or any other defects which would mark the appearance of the finished structure. Any lumber which had defects affecting its strength shall not be used.

6. In designing forms, concrete shall be considered as a liquid weighing 150 pounds per cubic foot for vertical loads and for computing the hydrostatic head for horizontal pressure. In addition, a live load allowance of 50 pounds per square foot shall be used on horizontal projections of surfaces. Forms shall be designed so that no member will develop a dead

load deflection of more than 1/270th of the span.

7. Spreader blocks and non "stay-in-place" bracing shall be removed from forms before concrete is placed. In no case, shall any portion of wood be left in the concrete.

B. Forms for Permanently Exposed Surfaces:

1. Forms for concrete surfaces that will be permanently exposed to view shall be constructed of plywood or of metal panels. Wood or metal linings for forms shall be of such kind and quality, or shall be so treated or coated, that there will be no chemical deterioration or discoloration of the formed concrete surface. The type and condition of form linings, and the construction of the forms, shall be such that form surfaces will be even and uniform.

2. Plywood sheets less than five-eighth inch in thickness shall be placed against a solid wood backing of three-quarter inch sheathing. Plywood sheets five-eighth inch or more in thickness may be used without backing, provided the forms are constructed to withstand pressure developed during placing of concrete without producing visible waviness between studs. Plywood sheets shall be placed so that joints are tight and with the long dimension horizontal.

3. Metal for forms shall be of such thickness that the forms will remain true to shape. Clamps, pins, or other connecting devices shall be such that they will hold the forms rigidly together in place and allow removal without injury to the concrete. Metal forms which do not present a smooth surface or line up properly shall not be used. All metal forms shall be kept free from rust, grease, or other foreign material which would discolor the concrete.

4. Form panels, either of wood or metal, shall be constructed and assembled so as to result in tight joints between the panels.

C. Form Anchorage:

1. Forms shall be securely tied together with approved rods, and braced in a substantial and unyielding manner. In general, tie rods shall be designed to also act as struts or spreader. Wood struts will not be permitted to remain in the concrete.

2. For concrete surfaces that will be permanently exposed to view, metal ties or anchorages within the forms shall be constructed so as to permit their removal to a depth of at least one and one-half inches from the face without injury to the concrete. The cavities on both sides of the concrete resulting from the removal of the end of form ties shall be filled with dry-pack Portland cement mortar having the same proportions of cement and sand as the mortar in the body of the concrete. The surface of the filling shall be left sound, smooth and, even and shall match, insofar as practicable, the color of the adjacent concrete.

3. Devices which, when removed, will leave an opening entirely through the concrete will not be permitted. Wire ties shall not be used. Any parts of metal supports or spacers for reinforcement that are left in place within one and one-half inches of an exposed surface of the concrete shall be of non-rusting metal or have a non-rusting coating. If such parts are galvanized, the weight of zinc coating shall average not less than two ounces per square foot of actual surface.

D. Inspection of Forms:

1. All dimensions of forms in place shall be carefully checked before concrete is placed. Immediately prior to placing concrete, any warpings or bulging shall be corrected and all dirt, sawdust, shavings, or other debris removed. In narrow walls where the bottom of the forms are otherwise inaccessible, the lower boards or panels shall be left loose on the back side so that extraneous material can be removed just prior to placing concrete.

2. If during placing of the concrete, the forms show signs of bulging or sagging, they shall be properly realigned and securely braced, and, if necessary to make proper correction, the portion of the concrete affected shall be removed.

3. When forms are unsatisfactory in any way, either before or during the placing of concrete, the placing shall be suspended until the defects are corrected.

4. If the forms develop any defects, such as bulging, sagging, leakage or irregular surfaces after the concrete has been poured, that portion of the work shall be removed, reconstructed or repaired as directed by the Engineer without additional compensation to the Contractor.

3.03 PLACING FINISHING AND CURING

A. Bonding Grout:

1. After the existing concrete surface has been cleaned, it shall be uniformly saturated by pre-wetting for 2 hours minimum. Surface must be wet to saturated surface dry (SSD) condition, and any freestanding water shall be completely removed prior to placing the bonding grout. Immediately before placing concrete, a thin coating of bonding grout shall be scrubbed into the properly prepared surface of the existing concrete. Proper workmanship shall be exercised to insure that all existing surfaces receive a thorough, even coating and that no excess grout is permitted to collect in pockets. The rate of progress in applying grout shall be limited so that the grout does not become dry before it is covered with new concrete.

2. Bonding grout for patching concrete to existing concrete shall consist of equal parts by weight of Portland cement and sand mixed in a portable mechanical mixer with sufficient water to form a stiff slurry. The consistency of this slurry shall be such that it can be applied with a stiff brush or broom to the old concrete in a thin, even coating that will not run or puddle in low spots.

3. Should the bonding grout dry before the concrete is placed, the Contractor will remove the dried grout and sandblast clean the grouted surface, at his expense, before placing fresh bonding grout.

B. Placing and finishing: After the bonding grout has been applied, concrete shall be placed, consolidated by vibration, and shall be finished by screening and bull floating to bring the finished surface to specified elevation. The surface shall then receive a light broom finish, as directed by the Engineer. The reinforcing steel shall have a minimum concrete cover as required by ACI 318 or as shown on plans. The finished concrete shall be suitably protected, until the completion of the required curing period. Provide tooled joints between new and existing concrete surfaces.

C. Curing: The recommendations of ACI 308 Standard Practice for Curing Concrete shall be followed. When water is required to wet the surface of the newly placed concrete, it shall be applied as a fine

spray so that it will not mark or pond on the surface. Except where otherwise specified, the curing period shall be at least 72 hours. If high early strength concrete is approved by the Engineer, the curing period may be reduced as directed by the Engineer. If fly ash or slag is approved in the mix by the Engineer, the curing time will be extended. Curing shall be accomplished by wet curing only. The curing and sealing compound shall only be used on floor and slab areas approved by the Engineer.

1. The surface of the newly poured concrete shall be covered with wetted burlap as soon as the concrete has hardened sufficiently to prevent marring of the surface. The burlap shall overlap six inches. At least two layers of wetted burlap shall be placed on the finished surface. The burlap shall be kept saturated by means of a mechanically operated sprinkling system. In place of the sprinkling system, two layers of burlap may be substituted for one layer of burlap and impermeable covering.

   The burlap sheets shall be placed so that they are in contact with the vertical faces of concrete slabs after removal of slab forms, and that portion of the material in contact with those faces shall be kept saturated with water.

2. Membrane Curing Method. Membrane curing will not be permitted unless approved in writing by the Engineer. Concrete at these locations shall be cured by another method as specified above.

   After the concrete has been finished, the surface shall be cured with the specified curing compound. The seal shall be maintained for the specified curing period. The vertical faces of concrete slabs shall, likewise, be sealed immediately after the forms are removed. This high solids curing and sealing compound shall be applied at a maximum coverage rate of 250 square feet per gallon. These applications shall be made with mechanical equipment.

   At locations where the coating is discontinuous or where pin holes show or where the coating is damaged due to any cause and on areas adjacent to sawed joints, immediately after sawing is completed, an additional coating of membrane curing compound shall be applied at the rate of one gallon per 250 square feet.

3. The Engineer may order curing by another method specified herein if unsatisfactory results are obtained with a curing compound. Prior to starting The Work, the Contractor shall have available, at the site of The Work, supply of one of the other approved curing materials sufficient for curing one day's production.

4. The Contractor's construction operations including the management of traffic, shall be such as to avoid damage to the coatings of curing compound for period of not less than the curing period specified. Any curing compound that is damaged or that peels from the concrete surface within the curing period specified shall be repaired by the Contractor without delay and in an approved manner. No additional compensation will be allowed to the Contractor for performance of this work.

3.04 REMOVAL OF FORMS

A. General: Formwork may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 72 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

3.05 REUSE OF FORMS

A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable to Engineer.

3.06 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with bonding grout or proprietary repair products immediately after removal of forms, when acceptable to Engineer.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding grout has dried.

2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surface texture of surrounding concrete. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. Repair of Concrete Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.

1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

3.07 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General: The Contractor will employ and pay for a testing laboratory to perform tests and to submit test reports.

B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Engineer.

C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each truck delivering the concrete; additional tests when concrete consistency seems to have changed.

2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each truck of air-entrained concrete.

3. Concrete Temperature: Test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and each time a set of compression test specimens is made.

4. Compression Test Specimen: ASTM C 31; one set of 6 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.

5. Compressive Strength Tests: ASTM C 39; one set for each day's pour plus additional sets for every 50 cu. yds. after the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 3 days, two specimens tested at 7 days, 2 specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

6. When frequency of testing will provide fewer than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

7. When total quantity of a given class of concrete is less than 50 cu. yds., Engineer may waive strength test if adequate evidence of satisfactory strength is provided.

8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

D. Test results will be reported in writing to the Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for 7-day tests and 28-day tests.

E. Nondestructive 3-day Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor

shall pay for such tests when unacceptable concrete is verified.

END OF SECTION

SECTION 03 30 20 – CONCRETE REPAIR USING FAST SET MATERIALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections apply to the work of this section

1.02 SCOPE OF WORK

A. This work shall consist of the removal of existing delaminated concrete and the installation of a fast-setting, high-strength concrete at locations to be re-opened to traffic the following morning or designated by the Engineer. Materials in this specification may also be appropriate when the scope of concrete work is limited and it is not practical to use ready-mixed concrete.

1.03 QUALITY ASSURANCE

A. Placement of concrete during cold weather is to be in accordance with the latest version ACI 306. Cold weather concreting is required when a period for more than three successive days the average daily air temperature drops below 40 degrees Fahrenheit and stays below 50 degrees Fahrenheit for more than one-half of any 24 hour period.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The fast-setting concrete repairs must achieve a compressive strength of 3,500 psi within 3 hours.

B. The concrete shall resist freeze/thaw damage and scaling in compliance with ASTM Test Procedures C-666 and C-672. The products approved under this section shall be:

1. "MasterEmaco T 1060 or T 1061" as manufactured by BASF Building Systems (800) 433-9517.

2. “SikaQuick 1000 or 2500” as manufactured by Sika Corporation (800) 933-7452.

3. “Planitop 18, 18 TG, or 18 ES” as manufactured by Mapei (888) 876-2734.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. The exact location of spalled concrete to be repaired will be determined in the field by tapping of slab with a sounding rod, chain drag or hammer. An outline of the area to be repaired will be marked with chalk.

B. The areas of the spalled concrete to be removed will be outlined by making a sawcut around the perimeter of the spalled area. The minimum depth of sawcut shall be 1/2 inch. Do not, under any circumstances, cut existing reinforcing bars.

C. All loose unsound concrete shall be removed with pneumatic or electric jack hammer weighing no more than 15 lbs. may be used for removing concrete around mild steel reinforcement. Where unsound concrete is below reinforcement, removal to 3/4 inch below reinforcement is required.

D. All deteriorated reinforcing steel bars which have lost more than 20% (or more) of their cross-sectional areas or selected by the Engineer shall be replaced. New reinforcing steel bars shall be furnished and placed in accordance with Section 03200 of the technical specifications and under the directions of the Engineer.

E. The deck surface shall be blown clean with compressed air to assure that all loose or hollow concrete is removed. The reinforcing steel shall be sand blasted to remove all rust.

3.02 PLACING, FINISHING AND CURING

A. Place and properly mixed concrete into the prepared area from one side to the other. Do not place concrete in lifts. Work the material firmly into the bottom and sides of the patch to assure good bond. Do not retemper or finish material after initial set.

B. For maximum performance and minimal shrinkage, wet curing shall be performed for a minimum of 3 hours followed by the application of an approved curing compound.

3.03 TESTING:

A. A qualified testing laboratory will be retained to inspect the work. All costs associated with testing agency will be paid by the Contractor. The services of the testing laboratory will include any portion of the Contractor's work plus the following:

Neat Placed Material

1. Cast five 2" cubes for each test of all other proprietary products used. **NOTE: Brass cube molds must be utilized for all sampling meeting ASTM C109 requirements – plastic molds and inserts are prohibited.**

2. One set of cubes shall be taken for the first batch (20 c.f. or less) plus an additional set for every 20 c.f. after the first batch, or one every fourth batch (20 c.f. or less) which every yields more tests. At a minimum, test samples shall be taken for each day of placement.

3. Test one cube at one day, one cube at three days, one cube at seven days, one at 28 days, and keep one as a reserve.

4. Furnish all molds, labor, materials, and equipment necessary to complete testing specified herein.

5. Use applicable procedures:

Compression test sampling: ASTM C172

Making and curing specimens: ASTM C31
Testing of cubes: ASTM C109
Slump test: ASTM C143
Air content: ASTM C173
Testing of cylinders: ASTM C39.

6. Submit certified reports on the same day that tests are made. The reports shall include the description of the mix tested, location of the pour, weather conditions, other pertinent data, and any non-compliance with project requirements. Provide copies of the reports to the Owner, the Engineer, the Contractor, and the concrete supplier.

7. All testing is to meet or exceed properties (compressive strength, perm value, etc.) listed in the manufacturer's Technical Data sheet (including compressive strength values for 1 day, 3 day, 7 day, 28 day, etc.).

Extended/Pre-Extended Material

1. Cast five 3" x 6" cylinders for each test of all other proprietary products used. **NOTE: All sampling shall meet ASTM C39 requirements.**

2. One set of cylinders shall be taken for the first batch (20 c.f. or less) plus an additional set for every 20 c.f. after the first batch, or one every fourth batch (20 c.f. or less) which every yields more tests. At a minimum, test samples shall be taken for each day of placement.

3. Test one cylinder at one day, one cylinder at three days, one cylinder at seven days, one at 28 days, and keep one as a reserve.

4. Furnish all molds, labor, materials, and equipment necessary to complete testing specified herein.

5. Use applicable procedures:

   Compression test sampling: ASTM C172
   Making and curing specimens: ASTM C31
   Slump test: ASTM C143
   Air content: ASTM C173
   Testing of cylinders: ASTM C39.

6. Submit certified reports on the same day that tests are made. The reports shall include the description of the mix tested, location of the pour, weather conditions, other pertinent data, and any non-compliance with project requirements. Provide copies of the reports to the Owner, the Engineer, the Contractor, and the concrete supplier.

7. All testing is to meet or exceed properties (compressive strength, perm value, etc.) listed in the manufacturer's Technical Data sheet (including compressive strength values for 1 day, 3 day, 7 day, 28 day, etc.).

B. The use of testing services shall in no way relieve this Contractor of his responsibility to furnish materials and construction in full compliance with the project Drawings and Specifications.

C. Additional testing will be required if the 28-day tests show strengths less than that which is required. The cost of these tests shall be borne by the Contractor and may include breaking the spare test cylinder, core tests, and also the use of mechanical, electrical, or electronic testing devices.

D. Additional testing will also be required if there is evidence of faulty workmanship, frozen concrete, or any violation of project requirements. This additional testing shall be as directed by the Engineer and costs therefrom shall be borne by the Contractor.

E. Cost of trial mix design and materials shall be paid by the Contractor.

F. This Contractor shall cooperate with and assist the testing laboratory in performing all tests and inspections required for the concrete work, and shall:

1. Advise the testing laboratory sufficiently in advance of all operations to allow for completion of quality tests and for the assignment of personnel.

2. Furnish labor, as is necessary, to obtain and handle samples at the project site or at other locations of sources of materials.

3. Provide adequate approved facilities on the project site for proper storing and curing of test cubes/cylinders for the first 24 hours in accordance with ASTM C31, after which the cylinders shall be transferred to the testing laboratory.

G. The patched areas shall be sounded with a hammer after 7 days after concrete placement; any hollowness detected shall be corrected by the Contractor by removing and replacing the patch at no extra cost to the Owner. The contractor shall provide access, at their expense, for the Engineer to sound all repaired areas.

3.04 METHOD OF MEASUREMENT

This work will be measured for payment in square feet. The quantity of repair area will be computed from areas marked by the Contractor and approved by the Engineer.

END OF SECTION

SECTION 03 37 16 – FORM AND PUMP CONCRETE REPAIR MORTAR

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and all Divisions of the Specifications apply to this Section.

1.02 SCOPE OF WORK:

A. This work shall consist of the removal of existing unsound concrete to required depth and the installation of a prepackaged pump and pour repair mortar at locations indicated on drawings and/or at other locations designated by the Engineer.

1.03 QUALITY ASSURANCE

A. Placement of concrete during cold weather is to be in accordance with the latest version ACI 306. Cold weather concreting is required when a period for more than three successive days the average daily air temperature drops below 40 degrees Fahrenheit and stays below 50 degrees Fahrenheit for more than one-half of any 24 hour period.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. The pump and pour repair mortar shall achieve a minimum compressive strength of 5,000 psi in 28 days, and/or meet or exceed values listed in the manufacturer's technical data sheet, whichever is greater. The products approved under this section are as follows.

1. "MasterEmaco S440/S440MC" as manufactured by Master Builders (800) 433-9517
(Use MasterEmaco N 420 for rub-out of repair areas per manuf. recommendations)

2. "SikaQuick FNP" as manufactured by Sika Corporation (800) 933-7452
(Use SikaQuick VOH for rub-out of repair areas per manuf. recommendations)

3. "Planitop 15 or Planitop FD" as manufactured by Mapei (888) 876-2734.
(Use Planitop X for rub-out of repair areas per manuf. recommendations)

4. "ChemPatch Form & Pour" as manufactured by ChemMasters (800) 486-7866.
(Use ChemRub for rub-out of repair areas per manuf. recommendations)

PART 3 - EXECUTION

3.01 SURFACE PREPARATIONS:

A. Saw cut the perimeter of the repair area to a minimum depth of 3/8".

B. All loose and unsound concrete shall be removed with small chipping hammers to provide a minimum ¼" substrate profile. Remove concrete a minimum of 3/4" beyond the reinforcing steel.

C. The surface shall be blown clean with compressed air to assure that all loose and hollow concrete is removed. The reinforcing steel shall be sandblasted to remove all rust. All measures must be taken to prevent flash rusting from occurring to the reinforcing steel.

D. Forms shall be watertight. Apply a suitable form release to the forms.

3.02 PLACING, FINISHING, AND CURING:

A. Apply patching material as follows and in accordance with manufacturer's recommendations.

B. Mix the repair mortar according to manufacturer's recommendations. Follow the manufacturer's guidelines for extending the repair mortar by adding aggregate as required.

C. Saturate the surface dry with water so that it maintains a dark gray color one half hour before placing.

D. Vibrate form while pumping repair mortar using a variable pressure pump. Do not overpump so that the forms deflect.

E. Cure the repaired area as recommended by the repair mortar manufacturer.

F. All repairs are to be compliant with ACI 306.1 Standard Specification for Cold Weather Concrete, which includes temperatures associated with substrate, mixing, and placement/curing. Provide artificial heat and/or temporary housings, coverings and insulation to maintain a cure temperature on all sides of the freshly placed concrete at either 55 degrees F for 24 hours minimum or a duration until a compressive strength of 4,000 psi is achieved, which every is greater.

3.03 TESTING:

A. A qualified testing laboratory will be retained to inspect the work. All costs associated with testing agency will be paid by the Contractor. The services of the testing laboratory will include any portion of the Contractor's work plus the following:

Neat Placed Material

1. Cast five 2" cubes for each test of all other proprietary products used. **NOTE: Brass cube molds must be utilized for all sampling meeting ASTM C109 requirements – plastic molds and inserts are prohibited.**

2. One set of cubes shall be taken for the first batch (20 c.f. or less) plus an additional set for every 20 c.f. after the first batch, or one every fourth batch (20 c.f. or less) which every yields more tests. At a minimum, test samples shall be taken for each day of placement.

3. Test one cube at one day, one cube at three days, one cube at seven days, one at 28 days, and keep one as a reserve.

4. Furnish all molds, labor, materials, and equipment necessary to complete testing specified herein.

5. Use applicable procedures:

   Compression test sampling: ASTM C172
   Making and curing specimens: ASTM C31
   Testing of cubes: ASTM C109
   Slump test: ASTM C143
   Air content: ASTM C173
   Testing of cylinders: ASTM C39.

6. Submit certified reports on the same day that tests are made. The reports shall include the description of the mix tested, location of the pour, weather conditions, other pertinent data, and any non-compliance with project requirements. Provide copies of the reports to the Owner, the Engineer, the Contractor, and the concrete supplier.

7. All testing is to meet or exceed properties (compressive strength, perm value, etc.) listed in the manufacturer's Technical Data sheet (including compressive strength values for 1 day, 3 day, 7 day, 28 day, etc.).

Extended/Pre-Extended Material

1. Cast five 3" x 6" cylinders for each test of all other proprietary products used. **NOTE: All sampling shall meet ASTM C39 requirements.**

2. One set of cylinders shall be taken for the first batch (20 c.f. or less) plus an additional set for every 20 c.f. after the first batch, or one every fourth batch (20 c.f. or less) which every yields more tests. At a minimum, test samples shall be taken for each day of placement.

3. Test one cylinder at one day, one cylinder at three days, one cylinder at seven days, one at 28 days, and keep one as a reserve.

4. Furnish all molds, labor, materials, and equipment necessary to complete testing specified herein.

5. Use applicable procedures:

   Compression test sampling: ASTM C172
   Making and curing specimens: ASTM C31
   Slump test: ASTM C143
   Air content: ASTM C173
   Testing of cylinders: ASTM C39.

6. Submit certified reports on the same day that tests are made. The reports shall include the description of the mix tested, location of the pour, weather conditions, other pertinent data, and any non-compliance with project requirements. Provide copies of the reports to the Owner, the Engineer, the Contractor, and the concrete supplier.

7. All testing is to meet or exceed properties (compressive strength, perm value, etc.) listed in the manufacturer's Technical Data sheet (including compressive strength values for 1 day, 3 day, 7 day, 28 day, etc.).

B. The use of testing services shall in no way relieve this Contractor of his responsibility to furnish materials and construction in full compliance with the project Drawings and Specifications.

C. Additional testing will be required if the 28-day tests show strengths less than that which is required. The cost of these tests shall be borne by this Contractor and may include breaking the spare test cylinder, core tests, and also the use of mechanical, electrical, or electronic testing devices.

D. Additional testing will also be required if there is evidence of faulty workmanship, frozen concrete, or any violation of project requirements. This additional testing shall be as directed by the Engineer and costs therefrom shall be borne by this Contractor.

E. Cost of trial mix design and materials shall be paid by the Contractor.

F. This Contractor shall cooperate with and assist the testing laboratory in performing all tests and inspections required for the concrete work, and shall:

1. Advise the testing laboratory sufficiently in advance of all operations to allow for completion of quality tests and for the assignment of personnel.

2. Furnish labor, as is necessary, to obtain and handle samples at the project site or at other locations of sources of materials.

3. Provide adequate approved facilities on the project site for proper storing and curing of test cylinders for the first 24 hours in accordance with ASTM C31, after which the cubes/cylinders shall be transferred to the testing laboratory.

G. The patched areas shall be sounded with a hammer after 7 days after concrete placement; any hollowness detected shall be corrected by the Contractor by removing and replacing the patch at no extra cost to the Owner. The contractor shall provide access, at their expense, for the Engineer to sound all repaired areas.

END OF SECTION

DIVISION 5

METALS

SECTION 05 50 00 – MISCELLANEOUS METALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 specification Sections apply to the work of this section.

1.02 DESCRIPTION OF WORK

A. The extent of Miscellaneous Metal items are typically shown on the drawings or called for in the specifications.

1.03 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to verify and supplement dimensions shown on Repair Drawings, where possible. Do not delay job progress; allow for trimming and fitting wherever taking field measurements before fabrication might delay work.

B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Materials shall be properly marked and match-marked where field assembly so requires. The sequence of shipment shall be such as to expedite and minimize the field handling of materials.

1.04 SUBMITTALS

A. Manufacturer's Data: Submit manufacturer's specifications, anchor details, and installation instruction for products to be used in the fabrication of miscellaneous metal work, including painting products.

B. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor bolt installation. Fabrication shall not proceed until shop drawings have been reviewed. Fabrication, assembly, and erection shall conform to reviewed shop drawings.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names, and roughness.

B. Structural Steel: See Specification Section 05 12 00

C. Steel Plates: ASTM A36 unless noted otherwise.

D. Steel Angles at Expansion Joint shall be hot-dip galvanized: ASTM A153.

E. Steel Plates to be Bent or Cold Formed: ASTM A283, Grade C.

F. Concrete Inserts: Threaded type, galvanized ferrous castings, either malleable iron ASTM A47 or cast steel ASTM A27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A153.

G. Non-shrink Nonferrous Grout: Five-Star Non-Shrink Grout, or approved equal.

H. All Miscellaneous metal components shall be factory hot-dipped galvanized and any abrasions shall be field corrected.

2.02 FASTENERS

A. General: Provide zinc-coated fasteners unless otherwise noted. Select fasteners for the type, grade, and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A307-86a, Grade A unless noted otherwise.

C. Steel anchors into existing concrete:

1. Epoxy anchors: Hilti HIT HY 150 Adhesive Anchor System
2. Expansion anchors: Hilti Kwik Bolt II Expansion Anchor

D. Lag Bolts: Square head type, FS FF-B-561C-70.

E. Machine Screws: Cadmium plated steel, FS FF-S-92B-75B-75.

F. Plain Washers: Round, carbon steel, FS FF-W-92B-74B-74.

G. Toggle Bolts: Tumble-wing type, FS FF-B-588C-74, type, class, and style as required.

H. Lock Washers: Helical spring type carbon steel, FS FF-W-84A-69.

2.03 PAINT

A. Metal Primer Paint: Tnemec No. 4-55 Versare, Dupont No. 67-746, PPG No. 6-20, or approved equal. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Division 9.

B. Galvanizing Repair and Primer Paint: Zinc dust, zinc oxide, alkyd paint conforming to FS TT-P-641, Type II.

2.04 FABRICATION, GENERAL

A. Workmanship:

1. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of

materials shown or specified for various components of work.

2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

3. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections grind exposed welds smooth and flush to match and blend with adjoining surfaces.

4. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts.

    a. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

    b. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

B. Galvanizing:

1. Provide a zinc coating for those items shown or specified to be galvanized, as follows:

    a. ASTM A153 for galvanizing iron and steel hardware.
    b. ASTM 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8 thick and heavier.
    c. ASTM A386 for galvanizing assembled steel products.

C. Shop Painting:

1. Shop paint miscellaneous metal work except surfaces and edges to be field welded and members or portions of members to be embedded in concrete or masonry which are galvanized, unless otherwise specified.

2. Remove scale, rust and other deleterious materials before applying shop coat. Clean in accordance with SSPC SP-3-63 “Power Tool Cleaning” to remove all scale, rust, and foreign matter after first solvent cleaning to remove all oil and grease.

3. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1 63 "Solvent Cleaning".

4. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at a rate to provide uniform dry film thickness of 2 to 4 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges, and exposed surfaces.

5. Apply one shop coat to fabricated metal items, except apply two coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from

the first.

2.05 MISCELLANEOUS METAL FABRICATIONS

A. Rough Hardware:

1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel shapes as required.

2. Manufacture or fabricate items of sizes, shapes, and dimensions required.

PART 3 - EXECUTION

3.01 PREPARATION

A. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.02 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, and other connectors as required.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrications, and are intended for bolted or screwed field connections.

D. Field Welding: Comply with AWS Code for procedures of manual shielded metal arc-welding, appearance and quality of welds made, and methods used in correcting welding work.

E. Touch-up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of the shop paint on miscellaneous metal is specified in Section 09 91 00 of these specifications.

END OF SECTION

DIVISION 7

THERMAL AND MOISTURE PROTECTION

SECTION 07 91 00 – EXPANSION JOINT SEALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SCOPE OF WORK

A. Furnish labor, materials, equipment, and supervision to install watertight, traffic bearing expansion joint seals in accordance with these specifications and as shown on the drawings.

1.03 QUALITY ASSURANCE

A. The manufacturer and approved applicator shall provide a 5 year guarantee that the joint seal will not leak or fail from normal vehicular traffic. Any failure of the new joint seal which occurs within the specified warranty period shall be repaired by the Contractor at no cost to the Owner.

B. Consult the Manufacturer's representative and establish the minimum provisions required to ensure satisfactory work. A licensed applicator with a minimum of 5 years experience on similar joints shall install the specified joint seal.

1.04 SUBMITTALS BY THE CONTRACTOR

A. The Contractor shall submit shop drawings showing all the expansion joint details required for this particular project for approval by the Engineer in addition to Manufacturer's literature.

B. Where required by jurisdiction, the Contractor shall submit test data showing that the expansion joint system (including fire barrier material) meets or exceeds fire rating requirements. Testing procedures shall be in accordance with requirements set forth or adopted by the local jurisdiction.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered on the job and stored in a place protected from damage, moisture, and exposure to the elements in exact accordance with manufacturer's instructions.

1.06 JOB CONDITIONS

A. Weather Conditions: Do not proceed with installation of expansion joints and sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and strength development of the nosing material.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The expansion joint seal system shall be a complete system of compatible materials designed by the manufacturer to produce a waterproof, traffic-bearing expansion joint seal. The system shall also meet or exceed any fire rating requirements set forth by the local building code requirements.

B. Approved Products:

Approved Winged Expansion Joint Seal Products:

1. "WaboCrete Membrane System," model ME-400, manufactured by Watson Bowman Acme, (www.wbacorp.com).

2. "Iso-Flex Winged Expansion Joint Sealing System", seal type J40L, as manufactured by LymTal International, Inc. (www.lymtal.com).

3. "Emseal Thermaflex," model TCR 400, manufactured by Emseal Joint Systems, Ltd. (www.emseal.com).\

Pre-compressed Expansion Joint Systems

1. "DSM System", as manufactured by Emseal Joint Systems, Ltd., size to be field verified.

2. "Iso-Flex Precom H-SL", as manufactured by LymTal International, Inc., size to be field verified.

3. "Wabo HSeal" as manufactured by Watson Bowman Acme, (www.wbacorp.com), size to be field verified.

Vertical Joint Systems

1. "Colorseal", as manufactured by Emseal Joint Systems, Ltd., size to be field verified.

2. "Iso-Flex Precom C", as manufactured by LymTal International, Inc., size to be field verified.

3. "Wabo WeatherSeal II" as manufactured by Watson Bowman Acme, (www.wbacorp.com), size to be field verified.

C. Contractor shall review specific details on drawings for the project regarding locations. Due to various joint width openings and overall block-out dimensions, the Contractor and expansion joint supplier should verify field condition prior to bid submission and execution of the work.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Preparatory Work:

1. The block-out shall be provided to the specified dimensions and acceptable to the manufacturer. The licensed installer shall additionally verify that the 'as-built' configuration of the block-out for the expansion joint will allow the expansion joint to be installed such that elevation differences in the vicinity of the joint and across the joint will not exceed industry and ADA-related recommendations. Any edge raveling at the joint opening or spalls shall be repaired with a suitable compound to provide a solid, square block-out.

2. The block-out substrate shall be sandblasted clean of all contaminants and impurities immediately prior to the system installation to assure proper adhesion.

3. The membrane gland element shall be unpackaged and laid in a relaxed position to relieve any temporary set from shipment packaging prior to placement. The pre-molded element shall be wiped clean with a solvent solution such as toluene.

4. It is recommended that adjacent deck surfaces be taped off and protected to assure a clean, neat professional installation.

B. Installation:

1. Joint installation shall be made in strict accordance with the manufacturer's written instruction.

2. Follow standard manufacturer's recommendation for installation of the material, taking into account block-out dimensions, joint width, and ambient temperature conditions.

3.02 TESTING

A. All new expansion joint seals shall be leak tested. Any leaking observed shall be rectified by the Contractor and the joint shall be re-tested until no leakage is observed. It is the responsibility of the Contractor to absolutely make certain that the joints are totally waterproofed.

END OF SECTION

SECTION 07 92 13 – JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SCOPE OF WORK:

A. Furnish labor, materials (including backer rods when required) and equipment for sealing and caulking of cracks, construction joints, control joints, and cove joints in the reinforced concrete structural slabs, at designated spandrel beam-to-column interfaces, at designated wall-to-wall interfaces, and at designated flashing locations or designated by the Engineer. Where applicable, the sealant shall be compatible with any specified waterproofing membrane base coat material.

1.03 JOB CONDITIONS:

A. The sealant shall be installed in floor cracks, construction and/or control joints, and cove joint in the reinforced concrete structural slabs, at designated spandrel beam-to-column interfaces, at designated wall-to-wall interfaces, and at designated flashing locations in the areas shown on drawings or designated by the Architect/Engineer. At locations that were previously sealed or filled with other materials, the existing sealant material shall be raked out and the exposed concrete cleaned by sandblasting or grinding at those locations designated for repair.

1.04 FULL RESPONSIBILITY:

A. System manufacturer will have the full responsibility for: (1) Instructing the Contractor on the required configuration of joints and (2) Reviewing and approving tooled joints constructed as a part of surface preparation prior to installing the sealant.

1.05 GUARANTEE:

A. The Contractor shall provide a single source performance guarantee that the joint system repaired, including related work in the slab installed by the Contractor, will not leak water or de-bond from adjacent concrete for a 5 year period starting from the date of substantial completion. Any repairs required during the guarantee period starting from the date of substantial completion shall be performed by the Contractor at no additional cost to the Owner.

1.06 APPLICATOR QUALIFICATIONS:

A. The Contractor shall have a minimum of three years of experience in performing work similar to that shown in the drawings and specifications.

B. The Contractor shall submit a list of five projects in which similar work to that specified hereinbefore was successfully completed. The list shall contain the following for each of the five projects:

1. Project Name

2. Owner of Project
3. Owner's Representative, Address and Telephone Number
4. Brief Description of Work
5. Cost of Portion of Work Similar to that Specified in this Section
6. Total Restoration Cost of Project
7. Date of Completion of Work

The sum of the costs of the five projects provided shall be a minimum of $50,000.

C. A full time on-site supervisor shall be provided by the contractor for the duration of the sealant and caulking work. This supervisor shall have had a minimum of 2 years documented supervisory experience with the products to be used.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. The sealant to be used shall meet or exceed the requirements of Interim Federal Specification TT-S0027-E, Sealants Class A, Type 1 and 2. The sealant shall not de-bond or fail while elongated 25 percent in a water immersion test, according to Federal Specification TT-S-0027-E. When tested according to Paragraph 4.3.5. of Federal Specification TT-S-0027-E, weight loss shall not be greater than 5 percent. Shore A hardness under standard conditions shall be 25-30.

B. Tee-To-Tee Joints, Control Joints, Construction Joints, & Cracks:

The joint sealant to be used for cracks, control joints, and construction joints shall be two component polyurethane sealants of the chemically curing type containing no asphalt, coal tar, or plasticizers. The sealant shall be used with a compatible primer specified by the manufacturer. Approved products for use are:

1. "MasterSeal SL2" as manufactured by BASF

2. "Iso-Flex 880GB Sealant" as manufactured by LymTal International, Inc. (800) 373-8100

3. "Sikaflex - 2C-SL," as manufactured by Sika Corporation (800)933-SIKA

C. The sealant to be used shall meet or exceed the requirements of Interim Federal Specification TT-S0027-E, Sealants Class A, Type 1 and 2. The sealant shall not de-bond or fail while elongated 25 percent in a water immersion test, according to Federal Specification TT-S-0027-E. When tested according to Paragraph 4.3.5. of Federal Specification TT-S-0027-E, weight loss shall not be greater than 5 percent. Shore A hardness under standard conditions shall be 25-30.

D. Cove Joints:

The cove sealant at designated spandrel beam-to-column interfaces, at designated wall-to-wall interfaces, floor slab to curb interfaces, column penetrations, and at designated flashing locations shall be a non-sag, multi-component polyurethane sealant of the chemically curing type containing no asphalt, coal tar, or plasticizers. The joint sealant shall comply with Federal Specification TT-S-00227E, Type II, Class A, Corporation of Consultants CRD-C-506-72; ASTM C-920-79, Type M, Grade NS, Class 25. Depending on the width and time of application, an

accelerator may be required by the manufacturer. Any additional cost associated with the use of an accelerator shall be included in the contractor's submitted pricing, as listed in the bid form.

Approved Sealants are as follows:

1. "MasterSeal NP2" as manufactured by BASF

2. "Iso-Flex 881 NS Sealant" as manufactured by LymTal International, Inc. (810) 373-8100

3. "Sikaflex - 2C-NS," as manufactured by Sika Corporation (800)933-SIKA

E. The manufacturer of the sealant system used in this project shall share responsibility for all sealant work and joint preparation work.

PART 3 - EXECUTION

3.01 TYPICAL SURFACE PREPARATION:

The Contractor shall either grind the surface of all cracks and construction joints designated for repair with sealant to the shape of ½" x ½" v-groove or sawcut a square ½" x ½" groove, grind sharp corner of groove and apply bond breaker to bottom horizontal surface. Edges of cracks or joints to be sealed shall be of sound concrete. Prior to installing sealant, surfaces shall be cleaned of foreign materials and debris, V-groove ground and primed.

3.02 RECORD OF SEALED CRACK AND JOINT LOCATIONS AND TYPES:

After determining the cracks and joints to be sealed and the detail types required, the Contractor shall prepare scale shop drawings showing the sealed crack and/or joint locations and submit them to the Architect/Engineer for his approval. The Shop Drawings submitted shall be reviewed by the Architect/Engineer for the condition of the existing cracks/joints, the size/shape of the routed crack, and the type of detail selected.

3.03 QUALITY CONTROL TESTING

A. General:

1. The Contractor will employ and pay for a testing agency to perform tests and to submit test reports.

2. All testing shall be performed by a qualified independent testing agency, which shall be submitted to the Engineer/Owner for approval.

3. All test reports shall include date, time, existing site conditions (temperature, rain, fog, cloudy, etc.), and test locations shown on a field drawing. All reports are to be submitted to the Engineer/Owner and manufacturer within one working day.

4. At the preconstruction meeting, a representative from an approved Testing Agency and a representative from the manufacturer must be present. During this meeting the scope of

the testing program will be discussed.

B. Adhesion Testing

1. Once the sealant is completely cured, adhesion testing shall be performed in accordance with ASTM C 1521 "Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints", "Destructive Procedure", Tail Procedure, Method A.

2. One test for every 100 ft in first 1,000 ft of sealant applied. If no test failure is observed in the first 1,000 ft of sealant applied, perform procedure every 1,000 ft thereafter. Once a failure occurs, the frequency shall revert to one test for every 100 ft in first 1,000 ft of sealant applied until no test failures occur, at which time the frequency can change to one test every 1,000 ft.

3. At failed test locations, two additional tests shall be performed along the length a continuous sealant installation (i.e. tee-to-tee joint, cover joint, etc.). When more than two failed tests occur along the length of a continuous sealant installation, the joint shall be removed in its entirety, the joint prepared, and new joint sealant installed at no additional cost.

4. All sampling areas shall be repaired in-kind by contractor and per the manufacturer's recommendation at no additional cost.

END OF SECTION

DIVISION 9

FINISHES

SECTION 09 30 130 – CERAMIC TILING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The extent of tile work is indicated on the Drawings and specified herein to include, but not be limited to the following:

1. Ceramic tile.

B. Related Work Specified Elsewhere:

1. Section 04 20 00 - Unit Masonry

2. Section 07 92 13 - Joint Sealants

1.02 REFERENCES

A. American National Standards Insitute (ANSI):

1. ANSI A108.1A, 2005 - Specifications for Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar.

2. ANSI A108.1B, 2005 - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.

3. ANSI A108.1C, 2005 - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar -or- Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.

4. ANSI A108.4, 2005 - Specifications for Ceramic Tile Installed with Organic Adhesives or Water-Cleanable Tile Setting Epoxy Adhesive.

5. ANSI A108.5, 2005 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement

6. ANSI A108.6, 2005 - Specifications for Ceramic Tile Installed with Chemical-Resistant, WaterCleanable Tile-Setting and -Grouting Epoxy.

7. ANSI A108.8, 2005 - Specifications for Ceramic Tile Installed with Chemical-Resistant Furan Mortar and Grout.

8. ANSI A108.9, 2005 - Specifications for Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.

9. ANSI A108.10, 2005 - Specifications for Installation of Grout in Tilework.

10. ANSI A118.1, 2005 - Standard Specification for Dry-Set Portland Cement Mortar.

11. ANSI A118.3, 2005 - Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.

12. ANSI A118.4, 2005 - Latex-Portland Cement Mortar.

13. ANSI A118.5, 2005 - Chemical-Resistant Furan Mortar and Grout.

14. ANSI A118.6, 2005 - Standard Ceramic Tile Grouts.

15. ANSI A118.7, 2005 - Polymer Modified Cement Grouts

16. ANSI A118.8, 2005 - Modified Epoxy Emulsion Mortar/Grout.

17. ANSI A118.9, 2005 - Test Methods and Specifications for Cementitious Backer Units

18. ANSI A118.10, 2005 - Load bearing, Bonded, Waterproof Membranes for Thinset Ceramic Tile and Dimensional Stone.

19. ANSI A118.11, 2005 - Exterior Grade Plywood (EGP) Latex-Portland Cement Mortar.

20. ANSI A136.1, 2005 - Organic Adhesives for Installation of Ceramic Tile.

B. American Society of Testing and Materials (ASTM International)

1. C67 Test Methods for Sampling and Testing Brick and Structural Clay Tile

2. C144 Standard Specification for Aggregate for Masonry Mortar.

3. C150 Specification for Portland Cement

4. C207 Standard Specification for Hydrated Lime for Masonry Purposes.

5. C270 Specification for Mortar for Unit Masonry

6. C482 Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste

7. C847 Standard Specification for Metal Lath.

8. C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method

9. D226 / D226M Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

10. D4397 Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.

C. Tile Council of North America (TCNA)

1. TCA Handbook for Ceramic Tile Installation, 2011.

1.03 SYSTEM REQUIREMENTS

A. Performance Requirements

1. Absorption (ASTM C67): Not more than 12%.

2. Freeze Thaw Resistance (ASTM C67): Unaffected after 50 cycles.

3. Compressive Strength (ASTM C67): Not less than 4000 psi (27,560 kPa).

4. Bond Strength (ASTM C482): 50 psi (0.3 MPa).

5. Static Coefficient of Friction (ASTM C1028):.

i. Level Surfaces: Minimum of 0.6 (Wet).

ii. Step Treads: Minimum of 0.6 (Wet).

iii. Ramp Surfaces: Minimum of 0.8 (Wet).

6. Breaking Load (ASTM C67): Minimum load 300 lbs

1.04 QUALITY ASSURANCE

A. Source: For each type of tile required for the work of this section, provide products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.

B. Mock-up: Before beginning primary work of this section, provide 3' x 3' mock-ups of each type of tile work and installation required under the Contract at locations acceptable to Architect and obtain Architect's acceptance of visual qualities. Protect and maintain acceptable mock-up throughout the work of this section to serve as criteria for acceptance of this work. Approved mock-ups may be incorporated into the finished work.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material used. Provide certifications stating that materials comply with requirements.

B. Initial Selection Samples: Submit samples showing complete range of colors, textures, and finishes available for each material used.

C. Verification Samples: Submit representative samples of each material that is to be exposed in the finished work, showing the full range of color and finish variations expected. Provide samples having minimum area of 144 square inches mounted on hardboard and grouted. Provide full size trim samples and 6" lengths of stone thresholds.

1.06 PRODUCT HANDLING

A. Deliver materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry, well-ventilated space, protected from the weather, under cover and

off the ground.

1.07 JOB CONDITIONS

A. Perform work only when conditions are within the limits established by manufacturers of the materials and products used. Maintain manufacturer's recommended curing/setting temperatures for at least 7 days after installation.

B. Proceed with work only when substrate construction and penetrating work is complete.

PART 2 - PRODUCTS

2.01 MATERIALS AND PRODUCTS

A. Acceptable Manufacturer: Crossville (Fierst Distributing, 746 Trumbull Drive, Pittsburgh, PA 15205; Tel: (412) 429-9300.

1. Requests for substitutions will be considered in accordance with Performance Requirements.

2.02 TILE

A. General: Provide tile that complies with ANSI A137.1 for types, compositions and other characteristics indicated. Provide tile in the locations and of the types colors and pattern indicated on the Drawings and identified in the Schedule and the end of this Section. Tile shall also be provided in accordance with the following:

1. Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken from other packages.

2. Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer, unless otherwise specified.

3. Factory Applied Temporary Protective Coatings: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by pre-coating with a continuous film of petroleum paraffin wax applied hot. Do not coat unexposed tile surfaces.

B. Ceramic Floor Tile:

1. Style/Pattern: Moonstruck.

2. Color: Luna

2. Moisture Absorption: Less than .5 percent to less than 20 percent.

3. Size and Shape: 12 x 24, nominal.

4. Installation Method: Brick.

5. Trim Units: Matching cove base, cove base corner, bullnose, cove/inside finger cove,

radius cap, sink rail incorner/outcorner, outside cove corner shapes in sizes coordinated with field tile.

C. Grout: Latex-Portland cement grout compound consisting of Portland cement, selected and graded aggregates, color pigments and latex additive that is compatible with latex additive in latex-modified thinset mortar. Provide colored grout with colors selected by Architect from manufacturer's standards: more than one color is required.

D. Tile Cleaner: Provide tile cleaner which is acceptable to tile manufacturer.

E. Thinset Latex Portland Cement Mortar: Provide factory packaged latex thinset Portland cement mortar complying with ANSI 118.84 specifications.

F. Organic Adhesive: Provide adhesive complying with ANSI A136.1 type I for showers and wet areas and type II for dry locations.

PART 3 - EXECUTION

3.01 INSPECTION

A. The Installer shall examine substrates and conditions under which this work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means installer accepts substrates and conditions.

3.02 INSTALLATION

A. Manufacturer's Instructions: Strictly comply with manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this section.

B. General Installation Requirements: Lay tile in grid pattern with floor, base and wall joints accurately aligned. Center tile in both directions to avoid use of less than 1/2 tile units.

1. Extend tilework into recesses and under and behind fixtures.

2. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignment.

3. Cut and drill tile without damaging decorative surfaces. Fit tile closely to fixtures, piping and other work.

4. For tile placed in sheets, make joints between sheets exactly the same width as joints within sheets.

5. Layout wall tile to next full tile beyond dimension indicated. Extend wall tile at least 3" above suspended acoustical ceilings, unless a wainscot is indicated.

C. Tile Installation Standards: Comply with requirements of the Tile Council of America Handbook for Ceramic Tile Installation and ANSI 108 series Standard Specifications for the Installation of Ceramic Tile. Provide complete installations including expansion joints as recommended by these standards even if not shown or otherwise indicated. Install tile to comply with the following referenced standards as follows:

1. Thinset Floors, Base and Thresholds Over Concrete Subfloor: TCA F113, thinset with latex-Portland cement mortar and latex-Portland cement grout.

2. Walls over Gypsum Board: TCA W242, organic adhesive with latex-Portland cement grout.

3. Walls Over Concrete Masonry Units: Thinset same as above.

D. Grouting: Mix and install grout in strict conformance with manufacturer's instructions and recommendations. Protect work from foot traffic for at least 7 days after grouting.

E. Expansion and Control Joints: Provide sealant filled crack control joints matching width of standard grout joints at all inside vertical corners or where tile abuts a restraining surface such as perimeter walls, columns, and dissimilar materials.

3.03 REPAIR, CLEANING AND PROTECTION

A. Repair: Repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot satisfactorily repaired. Leave work free of broken, chipped and loose tile.

B. Cleaning: Clean exposed surfaces using materials and methods recommended by manufacturer of tile being cleaned. Remove and replace work that cannot be successfully cleaned. Do not use acid cleaners unless specifically permitted by tile manufacturer and only after completely curing tile and grout. Protect adjacent surfaces from contact with acid cleaners and thoroughly flush with clean water.

C. Protection: Provide temporary protection to ensure work being without damage or deterioration at time of final acceptance. Remove protections and reclean as necessary immediately before final acceptance.

END OF SECTION

SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 DESCRIPTION OF WORK

A. The extent of painting work is shown on the drawings and specified herein to include, but not be limited to, the following:

1. Paint parking lines, traffic markings, handicap symbols and curb/island edges using a specified pavement marking paint throughout the entire parking deck.

2. Paint concrete repairs to match existing.

1.03 QUALITY ASSURANCE

A. Paint Coordination:

Provide finish coats which are compatible with the prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates.

1.04 SUBMITTALS

A. Manufacturer's Data:

1. Submit manufacturer's technical information in standard printed published form, including performance criteria and application instructions for each material proposed for use.

2. List each material and cross-reference to the specific paint and finish system and application. Identify by manufacturer's catalog number and general classification.

B. Samples:

1. Submit samples of each color required, for Engineer’s review.

2. Color shall be as herein specified or as selected by the Owner and Engineer prior to the start of work.

1.05 OWNER'S INVENTORY

A. Provide one gallon of each color used, to Owner, for maintenance purposes.

1.06 DELIVERY AND STORAGE

A. Deliver all paint to site in manufacturer's sealed and labeled containers. Labels shall bear manufacturer's name, brand, type of paint, Federal spec. number (if applicable), color of paint, and instructions for reducing.

B. Store materials and equipment in a designated storage space on the site. Keep storage space neat, clean and accessible at all times. Protect floors from paint spillage.

1.07 PROTECTION

A. Place paint or solvent-soaked rags, waste, or other materials which might constitute a fire hazard in metal containers and remove from premises at the close of each day's work. Take every precaution to avoid damage by fire.

B. Provide foam type 2-1/2 gallon capacity fire extinguishers for each paint storage space.

C. Protect the work of all other trades against damage, marking or injury by suitable covering during the progress of the painting and finishing work.

1.08 JOB CONDITIONS

A. Examine all surfaces to receive coatings and report to the Engineer any condition which is not acceptable. Commencement of work and in any area constitutes acceptance of conditions and places the responsibility for a workmanlike job on this Section.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 95 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.

1.09 WARRANTY

A. Materials Manufacturer and Installation Contractor shall warrant the installed system for a minimum period of five years from date of final completion, with the exception of pavement marking, which shall be warranted for a minimum period of one year from the date of final completion. The Installer shall repair or replace coatings that are debonded, peeling, prematurely faded, deteriorates excessively, wears prematurely, or otherwise fails to perform as required within the guarantee period, due to failure of materials or workmanship.

PART 2 - PRODUCTS

2.01 MATERIAL QUALITY

A. Provide only absolutely pure linseed oil, turpentine, shellac, and other like materials that are of the highest quality, with identifying labels intact and seals unbroken. Use no thinners other than those specified by the manufacturer.

B. Use only primers and undercoaters that are suitable for each surface to be covered and that are compatible with the finish coat required.

C. Use products of the same manufacturer for succeeding coats.

1. Where shop primed materials are to be finish painted and/or prime coat materials are by a different manufacturer than the finish coat materials, confirm compatibility of the primers with the manufacturer of the finish coat paints.

2. Where existing previously painted surfaces are to be finish painted, confirm compatibility of existing painted surfaces with the manufacturer of the succeeding new paints.

D. All materials shall comply with Environmental Protection Agency Pt. 59, Subpt. D, Table 1 of Section 40CFR Parts 53-59, Volume 5, 2004 Edition.

2.02 CONCRETE & MASONRY COATINGS

A. INTERIOR GARAGE/STAIR TOWERS

1. Concrete/CMU

a. Primers/Fillers

i. MasterProtect FL 749 as manufactured by BASF (800) 433-9517

ii. Neogard 7031-100 or 3090 Multi-Grip TM II Primer/Neogard 3781 Block Filler as manufactured by Neogard (214) 353-1600

iii. Elastocolor WB as manufactured by Mapei (888) 876-2734

iv. Sikagard 552W Primer or SikaLatex R as manufactured by Sika (800) 933-7452

b. Top Coat/Finish Coat

i. MasterProtect HB 200 LR as manufactured by BASF (800) 433-9517

ii. Neocrylic LR 7051 as manufactured by Neogard (214) 353-1600

iii. Elastocolor as manufactured by Mapei (888) 876-2734

iv. Sikagard 550W Elastocolor as manufactured by Sika (800) 933-7452

B. EXTERIOR GARAGE/FACADE

1. Concrete/CMU

a. Primers/Fillers

i. MasterProtect FL 749 as manufactured by BASF (800) 433-9517

ii. Neogard 7031-100 or 3090 Multi-Grip TM II Primer/Neogard 3781 Block Filler as manufactured by Neogard (214) 353-1600

ilI. Elastocolor WB as manufactured by Mapei (888) 876-2734

iv. Sikagard 552W Primer or SikaLatex R as manufactured by Sika (800) 933-7452

b. Top Coat/Finish Coat

i. MasterProtect HB 400 as manufactured by BASF (800) 433-9517

ii. Neocrylic HB as manufactured by Neogard (214) 353-1600

iii. Elastocolor as manufactured by Mapei (888) 876-2734

iv. Sikagard 550W Elastocolor as manufactured by Sika (800) 933-7452

2.03 PAVEMENT MARKING PAINT

A. Parking lines, arrows, handicap symbols and curb edges shall be yellow pavement marking paint, conforming to U.S. Bureau of Public Roads colors, unless otherwise noted.

1. ZONELINE Traffic and Zone Marking Latex, 11-54 Yellow by PPG Industries;

2. SETFAST Acrylic Latex Traffic Marking Paint, TM2161 Yellow by Sherwin Williams, 800-368-2026;

2. Hotline Fast Dry Latex Traffic Marking Paint – Yellow TM2153 as manufactured by Sherwin Williams, 800-368-2026;

3. Promar Low VOC Acrylic Copolymer Traffic Marking Paint – Yellow TM5713 as manufactured by Sherwin Williams, 800-368-2026.

2.04 PAINT SYSTEMS

A. Concrete & Masonry Coating:

1. INTERIOR GARAGE/STAIR TOWERS

a. Concrete/CMU

i. 1st Coat - Primer (4.0-8.0 mils dft) If necessary and/or as recommended by manufacturer.

ii. 2nd Coat – Top Coat (4.0-8.0 mils dft) Note: Multiple top coats may be required to achieve specified dft.

ii. 3rd Coat – Top Coat (4.0-8.0 mils dft) Note: Multiple top coats may be required to achieve specified dft.

Note: Minimum full system dft: 12.0-16.0 dft

2. EXTERIOR GARAGE/FACADE

a. Concrete/CMU

i. 1st Coat - Primer (4.0-8.0 mils dft) If necessary and/or as recommended by manufacturer.

ii. 2nd Coat – Top Coat (4.0-8.0 mils dft) Note: Multiple top coats may be required to achieve specified dft.

iii. 3rd Coat – Finish Coat (4.0-8.0 mils dft) Note: Multiple top coats may be required to achieve specified dft.

Note: Minimum full system dft: 12.0-16.0 dft

C. Pavement Markings: Two coats-Traffic Paint as specified in Section 2.03; 14 to 15 mil wet film thickness each coat.

PART 3 - EXECUTION

3.01 QUALITY CONTROL TESTING

A. General:

1. The Contractor will employ and pay for a testing laboratory to perform tests and to submit test reports.

2. All testing shall be performed by a qualified independent testing agency, which shall be submitted to the Engineer/Owner for approval.

3. All test reports shall include date, time, and existing site conditions (temperature, rain, fog, cloudy, etc.). All reports are to be submitted to the Engineer/Owner and manufacturer within one working day.

4. At the preconstruction meeting, a representative from an approved Testing Agency and a representative from the manufacturer must be present. During this meeting the scope of the testing program will be discussed.

B. Concrete and Masonry Materials:

1. Record wet film thickness readings every 1,000 s.f. or per manufacturer's recommendations, whichever is less square footage. Regardless of application area, a minimum of three readings shall be obtained.

2. Minimum dry film thickness shall be 6.0-8.0 mils per coat and/or per the manufacturer's recommendation.

3. Conduct adhesion testing per ASTM D3359. One test shall be performed every 5,000 s.f. or per manufacturer's recommendations, whichever is less square footage. A minimum of three tests shall be obtained.

3.02 SURFACE PREPARATION

A. General:

1. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.

2. Clean surfaces to be completely dry prior to applying primers, paints or surface treatments. Remove oil and grease with clean cloths and cleaning solvents. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

3. Before applying succeeding coats, primers and undercoats shall be completely integral and shall perform the function for which they are specified. Properly prepare and touch up all scratches, abrasions or other disfigurements and remove any foreign matter before proceeding with the following coat. All spot-priming or spot-coating shall be featheredged into adjacent coatings to produce a smooth and level surface.

B. Concrete and Masonry Materials:

1. Prepare surfaces of concrete and masonry (except glazed brick – see item 3.01.C.2) to be painted by using approved cleaning solvents (if necessary) and high-pressure power washing with a 15 degree tip at 14” or less from surface with a minimum pressure of 300 to 600 PSI for an existing coating and 1,500 to 3,000 PSI for bare concrete/masonry substrate and in accordance with SSPC SP1 to thoroughly remove all efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze, or provide sufficient bite on existing painted surfaces per the manufacturer’s recommendation.

2. For glazed brick, the surface shall be thoroughly cleaned, scuff sand the brick with 80 grit sanding sponges, then final wipe down with clean rags and denatured alcohol.

3.03 MATERIALS PREPARATION

A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.

C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials.

3.04 APPLICATION

A. Apply paint with brush, roller, spray, or other acceptable practice in accordance with the manufacturer's directions.

B. Spread all materials evenly and smoothly without runs, sags or other defects. Make edges of paint adjoining other materials or colors sharp and clean, without overlapping.

C. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.

D. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.

E. For each coat of paint use slightly different shade than preceding coat. Tint final undercoat to color of finish coat.

F. Paint directional arrows, parking stalls, marking lines, handicap symbols, etc., to be as detailed on the Drawings. Unless otherwise detailed, single line width to be four (4") inches wide. Striped areas shall be four (4) inch wide lines eighteen (18) inches on center. Lay out all painted lines and define with chalk markings for approval before proceeding with painting.

3.05 APPLICATION OF CONCRETE/MASONRY COATING

A. Prior to application record surface moisture content and pH of substrate. Surface moisture content must be 12% or lower. Refer to manufacturer for pH requirements.

B. Apply mock-up in a 36” x 36” square after surface is properly prepared.

C. Allow mock-up to cure for 5 days at a substrate temperature of 50 degree F or higher.

D. Conduct adhesion testing per ASTM D3359. A Classification of Adhesion Test Result of 4B or better is required, per Figure 1 of ASTM D3359.

E. Once mock-up meets or exceeds testing requirements and approval of Owner and Engineer, apply coating in accordance with manufacturer's printed instructions, employing technically trained personnel, using equipment specifically designed for this purpose.

F. Apply coating in two applications with a fine texture to match approved sample.

G. Finished work shall match approved samples; be uniform in sheen, color and texture and be free from defects detrimental to appearance or performance.

H. Verify dry film thickness of completed surfacing system in the field, at random, using a Tooke Inspection Gauge. Minimum thickness shall be as specified excluding foundation or fill coats. Conduct tests in presence of Engineer or his representative. A minimum of three readings are to be obtained or per manufacturer’s recommendation, whichever is greater.

3.06 CLEAN-UP

A. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.

B. Upon completion of painting work, clean paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

DIVISION 22

PLUMBING

SECTION 22 06 40 – PLUMBING FIXTURES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work under this Division of the Contract shall include all labor, materials, scaffolding, equipment, and services necessary for the installation of work related to drainage systems. The work in general shall include, but not be limited to the following:

1. Testing all work.
2. All drains, piping, hangers and flashing for piping.
3. All cutting required for installation of all plumbing work.
4. Guarantee all systems.

1.02 RELATED DOCUMENTS

A. Each Bidder shall examine all existing architectural, structural, plumbing, and electrical construction documents relating to this work and shall verify all governing conditions at the site and shall become fully informed as to the extent and character of the work in the building. No consideration will be granted for any alleged misunderstanding of the work to be done, it being understood that the submission of a proposal is an agreement to all items and conditions referred to herein or indicated on the accompanying Drawings.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. The following codes and specifications shall govern. In cases of conflict, the more stringent of the requirements shall be adhered to.

1. National Standard Plumbing Code
2. The BOCA National Building Code
3. State and/or Local Codes

B. This Contractor shall secure and pay for any necessary approvals, permits, inspections, etc., before commencing any work so as to avoid all delays during construction and he shall turn over the official records of the granting of permits to the Owner. This shall be done without additional cost to the Owner.

1.04 SUBMITTALS

A. The Plumbing Contractor shall submit shop drawings and manufacturer's data for all equipment and fixtures before work is fabricated and installed.

B. The Contractor shall submit a list of names of manufacturers of the various types of pipe, fittings, valves, appurtenances, and equipment properly indicating the specific service for which each item is to be used. After approval of the manufacturers' names, Contractor shall submit complete catalog data or Shop Drawings containing exact description of items to be furnished. Data of a general nature will not be accepted.

C. Certificates: Submit certificates from product manufacturers indicating materials comply with the referenced standards.

1.05 SUPERVISION

A. This Plumbing Contractor shall provide a competent supervisor who shall be constantly on the premises while job is in progress, and who shall familiarize himself with the requirements of all other Contracts, in order that the work may be coordinated and proceed in an efficient manner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All materials shall be the best of the respective kinds, suitable for the conditions and duties imposed upon them in service. They shall be the latest standard catalog products of the manufacturers indicated. Where two or more items of the same type of materials or equipment are required, they shall be the product of a single manufacturer.

B. Where the approval of manufactured article is by catalog number, it shall be construed as applying only to the article proper. All trimmings and fittings required shall be in strict conformity with the specification requirements.

C. It is hereby distinctly provided that the materials or appliances furnished shall comply with all requirements of the insurance underwriters and local inspection authorities and shall be provided, in all cases, with the necessary auxiliary or incidental trimmings required to make same complete.

2.02 HANGERS AND SUPPORTS

A. Furnish and install suitable hangers and supports for all piping lines. Hangers and supports shall be Grinnell, Crane, or Grabler. Provide supports which in each case will be amply strong and rigid for the load, and which shall not weaken or unduly stress the building construction.

B. Hangers shall be of heavy construction suitable for the size of pipe to be supported. All materials shall be wrought or malleable iron or steel. Hangers shall be swivel ring, split ring, wrought pipe clamp, or adjustable wrought clevis type.

C. Vertical risers shall be supported by heavy duty hangers installed close to the base of the pipe risers and by riser clamps at each floor level. Risers shall have extension clamps resting on floor slabs.

D. Support horizontal piping in accordance with the following schedule.

Pipe	Max. Hanger Spacing
Cast Iron Pipe	5'-0"
Steel Pipe	12'-0"
PVC Pipe	12’-0”

E. Provide a minimum of one hanger at each pipe fitting.

2.03 DRAINAGE SYSTEMS

A. Pipe and Fittings:

1. Match existing in-place materials, including color, schedule, and fitting type.

B. Floor Drains:

1. Floor drains in the protected membrane area on Level 1 shall be model Z521 12" heavy duty adjustable drain as manufactured by Zurn Industries, Inc. or approved equal. Floor drains shall be furnished with sediment bucket and all applicable options unless otherwise noted herein or on the drawings. Floor drains shall have secured grates.

2. Floor drains in all other areas shall be model Z505 12" heavy duty drain as manufactured by Zurn Industries, Inc. or approved equal. Floor drains shall be furnished with sediment bucket and all applicable options unless otherwise noted herein or on the drawings. Floor drains shall have secured grates.

C. Cleanouts:

1. Cleanout fittings shall be extra heavy pattern with cast brass screw jointed cleanout plug.

2. In piping larger than 4 inches in diameter, 4 inch cleanout plugs are to be used.

PART 3 - EXECUTION

3.01 INSTALLATIONS

A. Piping:

1. All piping at ceilings shall be hung from the construction above and as close as possible to the bottom of beams, slabs, etc.

2. Horizontal storm piping shall be installed at a uniform grade of not less than 1/8 inch per foot.

3. All risers shall be plumb and true, neatly spaced and parallel with walls and other pipes. Horizontal piping shall be straight and direct as possible, running at right angles with or parallel to walls and beams.

4. Protect all piping from entrance of dirt or other foreign materials during the construction period.

5. Piping shall be cut accurately to measurements established at the site and worked into place without springing or forcing. All cut pipe must have ends reamed and be free from burrs. Install piping to permit free expansion and contraction without damage.

6. Coordinate piping installations with structure, lighting, electrical conduit, and all other materials and equipment. Cutting or other weakening of building structure to facilitate piping installation is not permitted.

7. Provide necessary temporary connections, valves, oversize flushing connections, pumps, etc. as required to properly clean and test systems.

B. Supports & Sleeves:

1. Approved supports shall be installed and sized as required to carry the weight of the pipe and contents.

2. Provide cored hole for all pipes passing through floors and any other building construction, of adequate diameter to allow a minimum of 3/4 inch clearance all around.

3. Anchors shall consist of rigid members clamped or welded to the pipe to prevent pipe movement at that point. Attach anchors to structural members of building.

4. Support all risers at each floor level by means of clamp rests.

C. Joints:

1. Any leaking joints shall be completely disassembled and remade with new materials.

D. Accessibility:

1. All equipment shall be so arranged as to be accessible for repairs and replacement without disturbing adjacent work.

3.02 MECHANICAL CUTTING AND PATCHING

A. Contractor shall be responsible for all cutting, fitting, or patching of his Work which may be required to make its several parts come together properly. Cutting of structural members shall not be done without written approval of the Engineer.

B. Do all cutting and patching required for the installation of the Work. Any damage caused to the building by this cutting and patching, shall be corrected at no additional cost to the Owner.

C. Patching of all openings for new installations and all openings resulting from the removal of relocation of any installations shall be done by craftsmen skilled in the particular trade affected, with materials of like type.

3.03 DRAINAGE SYSTEMS

A. General:

1. Furnish and install floor drains including connections to existing storm drainage system as shown on the plans.

3.04 CLEANING

A. All piping, equipment, and appurtenances installed under this Section shall be thoroughly cleaned and properly protected during construction, and put in first class operating condition before being offered for acceptance.

B. In general, all painting will be done by others. All equipment shall be delivered to the job site with manufacturers standard shop finish. All equipment furnished under this Section shall be thoroughly cleaned and left ready for finished painting.

3.05 TESTS

A. Upon completion of the several portions of the Work, the various pieces of apparatus and equipment shall be tested to demonstrate that the same fulfills the specifications and requirements. The systems shall be tested in accordance with Local Code and in no case less than the following:

1. The entire system of piping shall be thoroughly blown out for the purpose of removing dirt and grease. This shall be continued for as long a period of time as is necessary to thoroughly clean the installations. The Contractor shall make good for any defects in the equipment which may result from pumping water containing any foreign matter.

2. Drainage Systems: The entire system existing and new portions of storm piping shall be tested by the Plumbing Contractor under a water test. The water test shall include the entire system from the lowest point to the highest pipe above the roofs. Water tests shall be made in accordance with all the local requirements.

3. Every portion of the system shall be tested to a hydrostatic pressure equivalent to at least a ten foot head of water. After filling, the Contractor shall shut off water supply and shall allow it to stand fifteen (15) minutes, under test, during which time there shall be no loss of leakage. Any defects in materials or workmanship found to exist and cause leakage, shall be repaired or replaced with new material as may be required by the Engineer, and the test repeated until work is shown to be watertight.

B. The Plumbing Contractor shall furnish and pay for all devices, materials, supplies, labor attendance, and power required in connection with all test. All tests shall be made in the presence and to the satisfaction of the Plumbing and other Inspectors of the local authorities.

C. Defects disclosed by the test shall be repaired or if required by the Engineer; defective work shall be replaced with new work without extra charge to the Owner. Test shall be repeated and directed until all work is proven satisfactory.

D. The Plumbing Contractor shall notify the Engineer and others having jurisdiction at least forty-eight (48) hours in advance of making the required tests so that arrangements may be made for their presence to witness the tests.

END OF SECTION