BID FOR

ROCK PARK RESTROOM

BID # 15/16-005

PWP # WA-2015-255

BIDS DUE NOT LATER THAN: 1:45 PM ON AUGUST 26, 2015

PUBLIC BID OPENING: 2:00 PM ON AUGUST 26, 2015

[NOTE: TIME BIDS ARE DUE IS DIFFERENT FROM BID OPENING TIME]

431 PRATER WAY
P.O. BOX 857
SPARKS, NV 89432-0857

Company Name: _____

CITY OF SPARKS
NOTICE TO BIDDERS
ROCK PARK RESTROOM
BID #15/16-005 / PWP #WA-2015-255

NOTICE IS HEREBY GIVEN that the City of Sparks, Nevada, will receive written sealed bids only, for the project listed above. Said bids must be in the hands of the Contracts and Risk Manager at 431 Prater Way, Sparks, Nevada, NO LATER THAN **1:45 PM ON AUGUST 26, 2015.** Bids postmarked prior to, but not received until after this deadline will not be accepted. Vendor bid response submittals may not be sent to the City of Sparks via the Internet/e-mail and will not be entertained for award by the City of Sparks. The right is reserved to reject any Bid/Proposal or to accept the Bid/Proposal which is deemed by the City of Sparks to be in the best interest of the City of Sparks. The City of Sparks reserves the right to waive any irregularities and/or informalities in the bid process.

All Bids are to be marked clearly on the outside. Bids will be opened and publicly read at **2:00 PM ON AUGUST 26, 2015**, at Sparks City Hall, 431 Prater Way Sparks, NV 89431.

PROJECT DESCRIPTION: Construction of a masonry building that will provide restroom facilities at Rock Park, which includes grading, construction, electrical, and mechanical, along with all appurtenant work necessary to complete the project as stated in the plans and bid specifications.

PRE-BID MEETING: A **NON-MANDATORY** pre-bid meeting will take place at 1:30PM on Thursday, August 13, 2015 at the job site: Rock Park – 1515 S. Rock Blvd., Sparks NV.

BONDING/LICENSING: A Bid Bond in the amount of 5% of bid amount is required. This bid bond will function as a penalty in the event the successful bidder fails to enter into a written contract with the City in accordance with the bid documents. Additionally, the City will be entitled to actual damages, if any. Prospective bidders will be required to have a current Contractor's License under the Nevada State Law for the type of work specified herein.

The work to be performed under this Contract shall be commenced by the successful Bidder after all executed Contract documents have been submitted, and after being notified to proceed by the City of Sparks.

Bid documents and specifications may be obtained from the City of Sparks website. Please visit http://www.cityofsparks.us/bids to obtain complete bid documents. There is no cost to use the system or obtain plans, but registration at the site is required. It is the responsibility of all potential bidders/responders to monitor the Purchasing Division's website for any changing information prior to submitting their bid/proposal. The City of Sparks will not be responsible for the timeliness or completeness of information provided by any 3rd party bid listing or re-selling service. For further information, contact the Purchasing Division at dmarran@cityofsparks.us or at (775) 353-2273. The individual responsible for coordinating this bid is: Dan Marran, CPPO, C.P.M. – Contracts and Risk Manager

Reno Gazette Journal Legal Notices Section
Publish Date: August 5, 2015
Proof of publication required

Bidder's Checklist

Bidders are instructed to complete and return the following forms in order for their bids to be complete. Failure to return the following items may result in your bid being declared "non-responsive."

1. _____ Bid Item Schedule
2. _____ Bidder Information Sheets
3. _____ Subcontractor Information Form (5% list due with bid submittal)
4. _____ Acknowledgement and Execution Form
5. _____ Certification Regarding Debarment
6. _____ "Certificate of Eligibility" (Local Preference) - If Contractor wishes to potentially apply their preference.
7. _____ Bid Bond
8. _____ Signed Bid Addenda (if applicable)

CITY OF SPARKS
ROCK PARK RESTROOM
BID #15/16-005 / PWP # WA-2015-255

PRICES must be valid for 90 calendar days after the bid opening.

COMPLETION of this project is expected **PURSUANT TO CONTRACT DOCUMENTS**.

BIDDER acknowledges receipt of _____ Addenda.

_____ _____
Bidder Name (signature)

BID ITEM SCHEDULE:

Item No.	Quantity	Unit	Description	Unit Price	Total Price
1.0	1	LS	Construction of the restroom facility per the plans and bid specifications complete and in place per lump sum.	$ _____ /LS	$ _____
2.0	1	LS	Force Account	$ 20,000 /LS	$ 20,000
			TOTAL BASE BID		$ _____

(Written amount GRAND TOTAL) $_____

Bid Schedule Notes

Notes: 1. The total base bid amount shall include both item 1.0 and item 2.0.

Bidder Information

COMPANY INFORMATION:

Company Name:
Contact Name:
Address:
City:
State / Zip Code:
Telephone Number including area code:
Fax Number including area code:
E-mail:

COMPANY BACKGROUND

1) Has your company ever failed to complete any contracts awarded to it? No___ Yes___ (If yes, please provide details.)

2) Has your company filed any arbitration request or law suits on contracts awarded within the last five years? No___ Yes___ (If yes, please provide details.)

3) Does your company now have any legal suits or arbitration claims pending or outstanding against it or any officers relating to the performance of a public contract? No___ Yes___ (If yes, please provide details.)

4) Does your company now employ any officers or principals who were with another firm when that company failed to complete a contract within the last five years? No___ Yes___ (If yes, please provide details.)

5) Has your company had a contract partially or completely terminated for default (cause) within the past five years? No___ Yes___ (If yes, please provide details.

6) Has your company been found non-responsible on a government bid within the last five years? No___ Yes___ (If yes, please provide details.)

Bidder Information

CONTRACTOR LICENSE INFORMATION:

Nevada State Contractor's License Number (If Applicable):
License Classification(s):
Limitation(s) of License:
Date Issued:
Date of Expiration:
Name of Licensee:
City, State, Zip Code of Licensee:
Telephone Number of Licensee:

BUSINESS LICENSING INFORMATION All vendors doing business within the City of Sparks are required to obtain and maintain a current business license from the City of Sparks prior to commencement of work (Sparks Municipal Code Section 5.08.020A). Vendor(s) awarded a contract resulting from this bid shall be required to obtain a current business license if they do not already hold one.

City of Sparks Business License Number:
Date Issued:
Date of Expiration:
Name of Licensee:
City, State, Zip Code of Licensee:
Telephone Number of Licensee:
Taxpayer Identification Number:

Bidder Information

DISCLOSURE OF PRINCIPALS:

a) **Individual and/or Partnership:**

Owner 1) Name:
Address:
City, State, Zip Code:
Telephone Number:
Owner 2) Name:
Address:
City, State, Zip Code:
Telephone Number:
Other 1) Title:
Name
Other 2) Title:
Name:

b) **Corporation:**

State in which Company is Incorporated:
Date Incorporated:
Name of Corporation:
Address
City, State, Zip Code:
Telephone Number:
President's Name:
Vice-President's Name:
Other 1) Name:
Title:

SUBCONTRACTOR DETAIL
SUBCONTRACTORS EXCEEDING FIVE PERCENT OF BID AMOUNT

INSTRUCTIONS: Per NRS 338.141, Bidder submits the following names of First-Tier Subcontractors who will provide to Bidder labor or a portion of the Work or improvements for which Subcontractor will be paid an amount exceeding five percent (5%) of the Bid Price. The Bidder shall list the name of a Subcontractor for each portion of the Work, the value of which exceeds five percent (5%) of the Bid Price. **If Bidder will perform more than 1% of the Work, BIDDER SHALL ALSO LIST HIS NAME and description of the work that the prime contractor will perform in the space provided below.**

Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		

Bidder Name: ___________________________ **Authorized Signature:** _________________________

SUBCONTRACTOR DETAIL
SUBCONTRACTORS EXCEEDING ONE PERCENT OF BID AMOUNT OR $50,000

INSTRUCTIONS: In compliance with NRS 338.141, Bidder submits the following names of First-Tier Subcontractors who will provide to Bidder labor or a portion of the Work or improvements for which Subcontractor will be paid an amount exceeding one percent (1%) of the Bid or $50,000, whichever is greater. The Bidder shall list the name of a Subcontractor for each portion of any of the Work the value of which exceeds one percent (1%) of the Bid Price.

Since all Subcontractors listed on the Bidder's 5% Subcontractor Information Form are over 1% of the Bid amount, those Subcontractors shall automatically be deemed incorporated into this 1% Subcontractor Information form and need not be re-listed below.

Information provided must be submitted within two (2) hours after the completion of the opening of the bids (Per NRS 338.141). Bidder shall enter "**NONE**" under "**Name of Subcontractor**" if not utilizing subcontractors exceeding this amount. This form must be complete in all respects. If, additional space is needed, attach a separate page. The bidder may elect to submit this information with the bid proposal and, in that case, the bidder will be considered as having submitted this information within the above two hours.

Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description & Value of Work:		

Bidder Name: _____ **Authorized Signature:** _____

CITY OF SPARKS ACKNOWLEDGMENT AND EXECUTION:

STATE OF _____)
) SS
County of _____)

_____ (Name of Principal) being first duly sworn, deposes and says: That he/she is the Bidder, or authorized agent of the Bidder for whom the aforesaid described work is to be performed by; that he/she has read the Plans, Specifications, and related documents including but not limited to, any addenda issued and understands the terms, conditions, and requirements thereof; that if his/her bid is accepted that he/she agrees to furnish and deliver all materials except those specified to be furnished by the City of Sparks (Owner) and to do and perform all work for the **ROCK PARK RESTROOM,** Bid # **15/16-005,** together with incidental items necessary to complete the work to be constructed and/or services to be provided in accordance with the Specifications, Plans, and Contract Documents annexed hereto.

TO THE CONTRACTS AND RISK MANAGER OF THE CITY OF SPARKS:
The undersigned, as Bidder, declares that the only persons or parties interested in this proposal, as principals, are those named herein, the Bidder is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid: that this proposal is made without collusion with any other person, firm or corporation; that he/she has carefully examined the location of the proposed work; the proposed form of Contract, the Contract Provisions, Plans, Specifications and Contract Documents incorporated therein referred to and made part thereof; that he/she proposes and agrees if this proposal is accepted, that he/she will contract with the City of Sparks in the form of the Contract prescribed, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the Contract and annexed Contract Provisions, Plans and Specifications, in the manner and time prescribed and according to the requirements of the Project Representative as therein set forth, it being understood and agreed that the quantities shown herein are approximate only and are subject to increase or decrease, and that he/she will accept, in full, payment therefore the indicated prices.

Contractor/Bidder:

(Printed Name of Contractor/Bidder) BY:

Firm:

Address:

City:

State / Zip Code:

Telephone Number:

Fax Number:

E-mail Address:

(Signature of Principal) Signature:

DATED this day of , 2015.

State of Nevada)
) SS.
County of _____)

On this day of , in the year 2015, before me,

/Notary Public, personally appeared Personally known to me (or proved

to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument, and acknowledged that he (she) executed it. WITNESS my hand and official seal.

Notary's Signature: My commission Expires:

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBIILTY MATTERS
(This form to be signed and returned at the time of bid)

The prospective bidder, _____ certifies to the best of its knowledge and belief that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. Any exceptions provided will not necessarily result in denial of award, but will be considered in determining bidder responsibility and whether or not the City will enter into contract with the party. For any exception noted, indicate on an attached sheet to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

_____

Typed Name & Title of Authorized Representative

_____

Signature of Authorized Representative Date

I am unable to certify to the above statement. My explanation is attached.

Signature_____Date_____

Local Preference Affidavit

***NEW Instructions*:** This form is required to receive a preference in bidding on projects exceeding $250,000. This form must be submitted no later than two (2) hours following the opening of bids, only if the bidder wishes for their preferential status(established by their current Certificate of Eligibility) to be considered in the evaluation of bids. A copy of the bidder's Certificate of Eligibility must be submitted at the time the contractor submits their bid.

I, _____, on behalf of the Contractor, _____, swear and affirm that in order to be in compliance with NRS 338.0117 and be eligible to receive a preference in bidding **ROCK PARK RESTROOM** (**Bid #15/16-005**) certify that the following requirement will be adhered to, documented and attained on completion of the contract. Upon submission of this affidavit on behalf of _____, I recognize and accept that failure to comply with any requirements is a material breach of the contract and entitles the City to damages. In addition, the Contractor may lose their preference designation and/or lose their ability to bid on public works for a period of time, pursuant to NRS 338:

1. The Contractor shall ensure at least 50 percent of workers employed on the public work possess a Nevada driver's license or identification card;

2. The Contractor shall ensure all vehicles used primarily for the public work will be registered and (where applicable) partially apportioned to Nevada;

3. The Contractor shall ensure payroll records related to this project are maintained and available within the State of Nevada.

These requirements are not applicable to Contractors who do not use the "Bidder's Preference" eligibility certificate in their bid or do not receive an advantage in ranking of bids due to their preference status.

By:_____ Title:_____

Signature:_____ Date:_____

Signed and sworn to (or affirmed) before me on this _____ day of _____, 20_____, by_____ (name of person making statement).

State of _____)
)ss.
County of _____)

_____ STAMP AND SEAL
Notary Signature

CITY OF SPARKS, NEVADA – 5% Bid Bond

KNOW ALL MEN BY THESE PRESENTS: That we the undersigned _____, as "Principal," and _____, as "Surety," are hereby held and firmly bound unto the City of Sparks, Nevada, as "Obligee," in the penal sum of _____dollars ($_____) for the payment of which, well and truly to be made, the Principal and Surety bind themselves, their heirs, executors, and administrators, successors and assigns, jointly and severally, by this instrument. The condition of the obligation of this bid bond is as follows:

WHEREAS, NRS 332.105 authorizes local governments to require bid bonds to insure execution and proper performance of the Contract and the Bonding Company has an "A" or better rating with Moody's or A.M. Best and T-Listed with the U.S. Treasury Department;

AND, WHEREAS, the Principal has submitted a bid for Bid # **15/16-005**, PWP # **WA-2015-255**, for the **ROCK PARK RESTROOM**.

NOW, THEREFORE,

(a) If said Bid shall be rejected; or

(b) If said Bid shall be accepted and the Principal shall execute and deliver the contract in the bid documents ("Contract") to Obligee in accordance with the terms of the bid documents, and give such bond or bonds as may be specified in the bid or contract documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or

(c) If the Principal shall pay to the Obligee the full amount of the bid bond as a penalty irrespective of the Obligee's actual damages in the event of the failure of the Principal to enter into such Contract and give such bond or bonds,

then, this obligation shall be null and void. Otherwise it shall remain in full force and effect, it being expressly understood and agreed that the liability of the Surety (but not of the Principal) for any and all claims hereunder shall, in no event, exceed the penal amount of the obligation as herein stated.

The Surety, for the consideration for which this bond was executed, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Obligee may accept such bid, and hereby waives notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and the Surety has caused their seal to be hereto affixed and these present to be signed by their proper officers.

Signed, Sealed and dated: _____

_____
Principal
By: _____

_____
Surety
By: _____

GENERAL CONDITIONS

GENERAL CONDITIONS

Please Read Carefully
These Provisions Are a Part of Your Bid and any Contract Awarded

Scope of Bid/Proposal: Bids/Proposals are hereby requested for **ROCK PARK RESTROOM**, as per specifications herein.

The bidder agrees that:

A. Bidder has carefully examined the specifications, and all provisions relating to the item(s) to be furnished or the work to be done; understands the meaning, intent, and requirements; and

B. Bidder will enter into a written contract and furnish the item(s) or complete the work in the time specified, and in strict conformity with the City of Sparks specifications for the prices quoted.

Note: Bidder is defined as any individual, partnership, or corporation submitting a bid, proposal, or quotation in response to a request for bid (RFB), request for proposal (RFP), request for information (RFI) or request for quotation (RFQ). A bidder may also be referred to as a bidder, contractor, supplier or vendor.

The use of the title "Bidder:, "Vendor", "Contractor" or "Consultant" within this solicitation document and any resulting contract shall be deemed interchangeable and shall refer to the person or entity with whom the City of Sparks is soliciting and/or contracting for the service or product referenced within the bid document.

1. Prices:
All prices and notations must be in ink or typewritten. Mistakes may be crossed out and corrections typed or written with ink adjacent to the error. Bids shall indicate the unit price extended to indicate the total price for each item bid. Any difference between the unit price correctly extended and the total price shown for all items bid shall be resolved in favor of the unit prices. Bidders are encouraged to review all prices prior to bid submittal, as withdrawal or correction may not be permitted after the bid has been opened.

2. Firm Prices:
Prices on bid shall be firm prices not subject to escalation unless otherwise provided for in the specifications. In the event the specifications provide for escalation, the maximum limit shall be shown, or the bid shall not be considered. In the event of a decline in market price below a price bid, the City of Sparks shall receive the benefit of such decline.

3. Items Offered:
If the item offered by the bidder has a trade name, brand and/or catalog number, such shall be stated in the bid. If the bidder proposes to furnish an item of a manufacturer or vendor other than that mentioned on the face hereof, bidder must specify maker, brand, quality, catalog number, or other trade designation. Unless such is noted on the bid form, it will be deemed that the item offered is that designated even though the bid may state "or equal".

4. Brand Names:
Whenever reference to a specific brand name is made by the City, it is intended to describe a component that has been determined to best meet operational, performance, or reliability standards of the City, thereby incorporating these standards by reference within the specifications. These specifications are not meant to limit the vendor; they are guidelines to minimum qualifications. The bidder shall indicate their compliance or non-compliance for each line of the specification. Any deviations from the specifications or where submitted literature does not fully support the meaning of the specifications must be clearly cited in writing by the bidder.

An equivalent ("or equal") may be offered by the bidder, subject to evaluation and acceptance by the City. It is the bidder's responsibility to provide, at bidder's expense, samples, test data, or other documentation the City may require to fully evaluate and determine acceptability of an offered substitute. The City reserves the sole right to reject a substituted component that will not meet or exceed City standards.

5. Samples:
Samples may be required for bid evaluation and testing purposes. Bidders shall agree to provide samples upon request and at no additional cost to the City.

6. Withdrawal of Bids:
Bids may be withdrawn by written or facsimile notice received prior to the exact hour and date specified for receipt of bid. A bid may also be withdrawn in person by a bidder, or bidder's authorized representative, prior to the exact hour and date set for receipt of bids. Telephone withdrawals are not permitted.

7. Late Bids, Modifications, or Withdrawals:
Bids, modifications of bids, or bid withdrawals received after the exact time and date specified for receipt will not be considered.

8. Mistake in Bid:
(a) If the bidder discovers a mistake in bid prior to the hour and date specified for receipt of bid, bidder may correct the mistake by withdrawing the bid in accordance with Item 7 above and resubmit prior to the stated bid deadline.

(b) If within seventy-two hours of the bid closing and prior to the issuance of a purchase order or a contract, the apparent low bidder discovers a mistake in bid of a serious and significant nature, bidder may request consideration be given to withdrawing the bid. The mistake must be evident and provable. The right is reserved by the City to reject any and all requests for withdrawal of bids. The decision of the Purchasing Manager is final as regards acceptance or rejection of requests for withdrawal after closing of bids.

(c) A mistake in bid cannot be considered once a purchase order or contract is issued.

9. Signature:
All bids shall be signed and the title and firm name indicated. A bid by a corporation shall be signed by an authorized officer, employee or agent with his or her title.

10. Exceptions:
A bidder deviating from specifications must specify any and all deviation(s). Failure to note said exceptions shall be interpreted to convey that the bidder shall propose to perform in the manner described and/or specified in this bid solicitation. If exception(s) are taken or alternatives offered, complete descriptions must be shown separately.

11. Confidential Information:
Any information deemed confidential or proprietary should be clearly identified by the bidder as such. It may then be protected and treated with confidentiality only to the extent permitted by state law. Otherwise the information shall be considered a public record. Information or data submitted with a bid will not be returned.

12. Quality:
Unless otherwise required in the specifications, all goods furnished shall be new and unused.

13. Litigation Warranty:

The bidder, by bidding, warrants that bidder is not currently involved in litigation or arbitration concerning the materials or bidder's performance concerning the same or similar material or service to be supplied pursuant to this contract of specification, and that no judgments or awards have been made against bidder on the basis of bidder's performance in supplying or installing the same or similar material or service, unless such fact is disclosed to the City in the bid. Disclosure may not disqualify the bidder. The City reserves the right to evaluate bids on the basis of the facts surrounding such litigation or arbitration and to require bidder to furnish the City with a surety bond executed by a surety company authorized to do business in the State of Nevada and approved by The City of Sparks in a sum equal to one hundred percent (100%) of the contract price conditional on the faithful performance by bidder of the contract in the event the bid is awarded to bidder, notwithstanding the litigation or arbitration.

14. Royalties, Licenses and Patents:

Unless otherwise specified, the bidder shall pay all royalties, license and patent fees. The bidder warrants that the materials to be supplied do not infringe any patent, trademark or copyright and further agrees to defend any and all suits, actions and claims for infringement that are brought against the City, and to defend, indemnify and hold harmless the City from all loss or damages, whether general, exemplary or punitive, as a result of any actual or claimed infringement asserted against the City, the bidder or those furnishing material to bidder pursuant to this contract.

15. Performance Standards:

Performance of work and acceptability of equipment or materials supplied pursuant to any contract or award shall be to the satisfaction and full discretion of the City.

16. Americans with Disabilities Act (ADA) Standards:

Bidders shall be required to comply with current ADA Standards in preparing their bids and executing work required under any contract resulting from this bid. Completed work must comply with current ADA Standards.

17. Warranties:

(a) Unless otherwise specified, all workmanship, material, labor or equipment provided under the contract shall be warranted by bidder and/or manufacturer for a minimum of twelve (12) months after acceptance by City. Greater warranty protection will be accepted. Lesser warranty protection must be indicated by bidder on the bid proposal as an exception.

(b) Bidder shall be considered primarily responsible to the City for all warranty service, parts and labor applicable to the goods or equipment provided by bidder under this bid or award, irrespective of whether bidder is an agent, broker, fabricator or manufacturer's dealer. Bidder shall be responsible for ensuring that warranty work is performed at a local agency or facility convenient to City and that services, parts and labor are available and provided to meet City's schedules and deadlines. If required and defined within the Scope of Work, the Bidder will post a performance bond after contract award to guarantee performance of these obligations. Bidder may establish a service contract with a local agency satisfactory to City to meet this obligation if bidder does not ordinarily provide warranty service.

18. Addenda:

The effect of all addenda to the bid documents shall be considered in the bid, and said addenda shall be made part of the bid documents and shall be returned with them. Before submitting a bid, each bidder shall ascertain

whether or not any addenda have been issued, and failure to acknowledge any such addenda may render the bid invalid and result in its rejection.

All potential bidders are responsible for monitoring the City website regarding the availability of new bid documents or addenda (where applicable). The City of Sparks will not be responsible for the results of any potential failures in automatic notification systems to potential bidders or plan holders with respect to these documents and will not adjust bid schedules or requirements due to any potential failures of those systems. It is the responsibility of all potential bidders/responders to monitor the Purchasing Division's website for any changing information prior to submitting their bid/proposal. The City of Sparks will not be responsible for the timeliness or completeness of information provided by any 3rd party bid listing or re-selling service.

19. Specifications to Prevail:
The detailed requirements of the Specifications, Scope of Work or Special Conditions shall supersede any conflicting reference in these General Conditions or the stated language on the City of Sparks Standard Purchase Order that are in conflict therewith.

20. Taxes:
The City is exempt from State, City and County Sales Taxes per NRS 372.325. The City will furnish Exemption Certificates for Federal Excise Tax when applicable.

21. Prevailing Wages:
Bidder is responsible for complying with all applicable local, State and Federal wage laws, whether or not specifically cited in this bid document.

Per NRS Sections 338.020 through 338.090, certain projects defined as "public works" require the payment of the prevailing wage as determined by the Labor Commissioner. Generally speaking, projects/contracts for construction of a public work valued at less than $100,000 are exempt from the prevailing wage requirement (NRS 338.080). Bidder shall be fully aware of the prevailing wage requirements of the State of Nevada as detailed in NRS Chapter 338 and price their bid response accordingly. Further information concerning Prevailing Wage rates can be found at:
http://www.laborcommissioner.com/publicworks_prevailingwage.html

Federal "Davis Bacon" wages may be applicable if the funding for the project includes Federal funds. These requirements are detailed in the "Special Conditions – Federal Requirements" section that will be included in this bid document when such conditions apply.

22. Conflict of Interest:
No City employee or elected or appointed member of City government, or member of the employee's immediate family, may participate directly or indirectly in the procurement process pertaining to this bid if they:

(a) Have a financial interest or other personal interest that is incompatible with the proper discharge of their official duties in the public interest or would tend to impair their independence, judgment or action in the performance of their official duties.

(b) Are negotiating for or have an arrangement concerning prospective employment with bidder. The bidder warrants to the best of his knowledge that the submission of the bid will not create such conflict of interest. In the event such a conflict occurs, the bidder is to report it immediately to the Purchasing Manager. For breach or violation of this warranty, the City shall have the right to annul this contract without liability at its discretion, and bidder may be subject to damages and/or debarment or suspension.

23. Disqualification of Bidder:

Any one or more of the following may be considered as sufficient for the disqualification of a prospective Bidder and the rejection of the Bid:

(a) The Bidder is not responsive or responsible.
(b) The quality of services, materials, equipment or labor offered does not conform to the approved plans and specifications.
(c) There is evidence of collusion among prospective Bidders (Participants in such collusion will receive no recognition as Bidders).
(d) The Bidder lacks the correct contractor's license classification required for the defined scope of work.
(e) Lack of competency, understanding of the scope of work, adequate machinery, plant and/or equipment as revealed in routine due diligence associated with bid evaluation.
(f) Unsatisfactory performance record as shown by past work for the City of Sparks, judged from the standpoint of workmanship, progress, and quality of services/goods provided.
(g) Uncompleted work which, in the judgment of the City of Sparks, might hinder or prevent the prompt completion of additional work, if awarded.
(h) Failure to pay or satisfactorily settle all bills due for labor and/or material on any contract(s).
(i) Failure to comply with any requirements of the City of Sparks.
(j) Failure to list, as required, all subcontractors who will be employed by the Bidder.
(k) Any other reason determined, in good faith, to be in the best interest of the City of Sparks.

24. Gratuities:

The City may rescind the right of the bidder to proceed under this agreement if it is found that gratuities in the form of entertainment, gifts, cash or otherwise are offered or given by the bidder, or any agent or representative of the bidder, to any officer or employee of the City with the intent of influencing award of this agreement or securing favorable treatment with respect to performance of this agreement.

25. Bidder's Security (This Section ☒ IS ☐ IS NOT Applicable to this bid):

A bid deposit in an amount equal to at least 5% of the bid may be required as a bid security by the City. The bid security may only be in cash, a cashier's or certified check made payable to the City of Sparks, or a bid bond. If the bid security is a bond, it shall be executed by a surety insurer authorized to issue surety bonds in the State of Nevada. All Bonding Companies must have an "A" rating or better with Moody's or A.M. Best Company, and be included on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bond and as Acceptable Reinsuring Companies" as published in circular 570 (as amended) by the audit staff, Bureau of Accounts, U.S. Treasury Department. (In other words, the company is T-listed.) The bid security must be executed by the bidder and enclosed with the bid proposal in the sealed bid envelope.

26. Performance and Payment Bonds:

Per NRS 339.025, before any contract, except one subject to the provisions of chapter 408 of NRS, exceeding $100,000 for any project for the new construction, repair or reconstruction of any public building or other public work or public improvement of any contracting body is awarded to any contractor, he shall furnish to the contracting body the following bonds which become binding upon the award of the contract to the contractor (All Bonding Companies must have an "A" rating or better with Moody's or A.M. Best Company, and be included on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bond and as Acceptable Reinsuring Companies" as published in circular 570 (as amended) by the audit staff, Bureau of Accounts, U.S. Treasury Department. (In other words, the company is T-listed.)):

Performance Bond (This Section ☒ IS ☐ IS NOT Applicable to this bid):
The Contractor awarded this bid will be required to furnish the City with a surety bond conditioned upon the faithful performance of the contract. This may take the form of a bond executed by a surety company authorized to do business in the State of Nevada and approved by the City of Sparks. The bond shall be in a sum equal to one hundred percent (100%) of the amount of the contract price. Such bond shall be forfeited to the City in the event that bidder receiving the contract shall fail or refuse to fulfill the requirements and all terms and conditions of the contract.

Payment Bond (This Section ☒ IS ☐ IS NOT Applicable to this bid):
The Contractor awarded this bid will be required to furnish the City with a payment bond**.** This may take the form of a bond executed by a surety company authorized to do business in the State of Nevada and approved by the City of Sparks. The bond shall be in a sum equal to one hundred percent (100%) of the amount of the contract price The bond must be solely for the protection of claimants supplying labor or materials to the contractor to whom the contract was awarded, or to any of his subcontractors, in the prosecution of the work provided for in such contract.

27. Indemnification:
To the fullest extent permitted by law, upon award, Contractor shall hold harmless, indemnify, defend and protect City, its affiliates, officers, agents, employees, volunteers, successors and assigns ("Indemnified Parties"), and each of them from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorney's fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever ("Claims") arising out of or related to any act or omission of Contractor, its employees, agents, representatives, or Subcontractors in any way related to the performance of work under this Agreement by Contractor, or to work performed by others under the direction or supervision of Contractor, including but not limited to:

1. Personal injury, including but not limited to bodily injury, emotional injury, sickness or disease, or death to persons;
2. Damage to property of anyone, including loss of use thereof;
3. Penalties from violation of any law or regulation caused by Contractor's action or inaction;
4. Failure of Contractor to comply with the Insurance requirements established under this Agreement;
5. Any violation by Contractor of any law or regulation in any way related to the occupational safety and health of employees.

In determining the nature of the claim against City, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against City.

If City's personnel are involved in defending such actions, Contractor shall reimburse City for the time and costs spent by such personnel at the rate charged City for such services by private professionals.

In cases of professional service agreements, requiring professional liability coverage:
If the insurer by which a Consultant is insured against professional liability does not so defend the City and applicable agents and/or staff, and the Consultant is adjudicated to be liable by a trier of fact, the City shall be entitled to reasonable attorney's fees and costs to be paid to the City by the Consultant in an amount which is proportionate to the liability of the of the Consultant.

Nothing in this contract shall be interpreted to waive nor does the City, by entering into this contract, waive any of the provisions found in Chapter 41 of the Nevada Revised Statutes.

28. Insurance:

BIDDERS' ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT BIDDERS CONFER WITH THEIR RESPECTIVE INSURANCE CARRIERS OR BROKERS TO DETERMINE IN ADVANCE OF BID SUBMISSION THE AVAILABILITY OF INSURANCE CERTIFICATES AND ENDORSEMENTS AS PRESCRIBED AND PROVIDED HEREIN. IF THE APPARENT LOW BIDDER FAILS TO COMPLY STRICTLY WITH THE INSURANCE REQUIREMENTS, THAT BIDDER MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Should work be required on City premises or within the public right-of-way, upon award of the contract, the bidder shall provide proof of Commercial General Liability Insurance and Automobile Liability, Professional Liability and Workers' Compensation if applicable, prior to initiation of any services under City, Bid, Proposal or Contract. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks and shall meet the following minimum specifications:

Contractor shall at its own expense carry and maintain at all times the following insurance coverage and limits of insurance. Contractor shall also cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified herein. All insurers must have AM Best rating not less than A-VII, and be acceptable to the City. Contractor shall furnish copies of certificates of insurance evidencing coverage for itself and for each subcontractor. Failure to maintain the required insurance may result in termination of this contract at City's option. If Contractor fails to maintain the insurance as set forth herein, City shall have the right, but not the obligation, to purchase said insurance at Contractor's expense.

Contractor shall provide proof of insurance for the lines of coverage, limits of insurance and other terms specified below prior to initiation of any services. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks and shall meet the following minimum specifications,

Contractor and any of its subcontractors shall carry and maintain coverage and limits no less than the following or the amount customarily carried by Contractor or any of its subcontractors, whichever is greater.

Applicable to this Contract	Insurance Type	Minimum Limit	Insurance Certificate	Additional Insured	Waiver of Subrogation
Yes	General Liability	$1,000,000	✔	✔	✔
Yes	Automobile Liability	$1,000,000	✔	✔	
Yes	Workers' Compensation	Statutory	✔		✔
Yes	Employer's Liability	$1,000,000	✔		
No	Professional Liability	$1,000,000	✔		
No	Pollution Legal Liability	$1,000,000	✔		

Commercial General Liability

Contractor shall carry and maintain a Commercial General Liability policy providing coverage for liability arising from premises, operations, independent contractors, products-completed operations liability, personal and advertising injury, and liability assumed under an insured contract (including, but not limited to, the tort liability of another assumed in a business contract).

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, employment-related practices, unless Subcontractor carries and maintains separate policies providing such coverage and provides Contractor evidence of insurance confirming the coverage.

Minimum Limits of Insurance

$1,000,000 Each Occurrence Limit for bodily injury and property damage
$2,000,000 General Aggregate Limit
$2,000,000 Products and Completed Operations Aggregate Limit
$10,000 Medical Expense Limit

If Commercial General Liability Insurance or other form with a general aggregate limit is used, the general aggregate limit shall be increased to equal twice the required occurrence limit or revised to apply separately to this PROJECT or LOCATION.

Coverage Form

Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Commercial General Liability (CGL) "Occurrence" form CG 00 01 04/13 or substitute form providing equivalent coverage.

Additional Insured

City, its officers, agents, employees, and volunteers are to be included as insureds in respects to damages and defense arising from: activities performed by or on behalf of Contractor, including the insured's general supervision of Contractor; products and completed operations of Contractor; premises owned, occupied, or used by Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Primary and Non-Contributory

Contractor's insurance coverage shall be primary insurance as it relates to City, its officers, agents, employees, and volunteers. Any insurance or self-insurance maintained by City, its officers, employees, or volunteers shall be excess of Contractor's insurance and shall not contribute with it in any way.

Separation of Insureds

Contractor's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the limits of the insurer's liability.

Endorsements

A policy endorsement is required listing all required additional insureds. The endorsement for CGL shall be at least as broad as the unmodified ISO additional insured endorsement CG 20 10 11/85 or a substitute form providing equivalent coverage for products and completed operations.

A waiver of subrogation in favor of City shall be endorsed to the policy using an unmodified Waiver of Transfer of Rights of Recovery of Others to Us ISO CG 24 04 05 09, or a substitute form providing equivalent coverage.

Business Automobile Liability

Minimum Limits of Insurance
$1,000,000 Combined Single Limit per accident for bodily injury and property damage or the limit customarily carried by Contractor, whichever is greater. No aggregate limit may apply. Coverage may be combined with Excess/Umbrella Liability coverage to meet the required limit.

Coverage Form
Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Business Automobile Coverage form CA 00 01 10/13, CA 00 25 10/13, CA 00 20 10/13 or substitute form providing equivalent coverage for Automobile Liability Symbol 1 for "Any Auto". If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01.

Additional Insured
City, its officers, agents, employees, and volunteers are to be included as insureds with respect to damages and defense arising from: activities performed by or on behalf of Contractor, including the insured's general supervision of Contractor; products and completed operations of Contractor; premises owned, occupied, or used by Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Endorsements
A policy endorsement is required listing all required additional insureds. The endorsement for Business Automobile Liability shall be at least as broad as the unmodified ISO CA 20 48 10/13 or a substitute form confirming City's insured status for Liability Coverage under the Who Is An Insured Provision contained in Section II of the coverage form ISO CA 00 01 10/13.

Workers' Compensation and Employer's Liability
Contractor shall carry and maintain workers' compensation and employer's liability insurance as required by NRS 616B.627 or provide proof that compliance with the provisions of Nevada Revised Statutes Chapters 616A-D and all other related chapters is not required. It is understood and agreed that there shall be no coverage provided for Contractor or any Subcontractor of the Contractor by the City. Contractor agrees, as a precondition to the performance of any work under this Agreement and as a precondition to any obligation of the City to make any payment under this Agreement to provide City with a certificate issued by an insurer in accordance with NRS 616B.627 and with a certificate of an insurer showing coverage pursuant to NRS 617.210.

It is further understood and agreed by and between City and Contractor that Contractor shall procure, pay for and maintain the above mentioned coverage at Contractor's sole cost and expense.

Should Contractor be self-funded for workers' compensation and employer's liability insurance, Contractor shall so notify City in writing prior to the signing of this Contract. City reserves the right to approve said

retentions, and may request additional documentation, financial or otherwise, for review prior to the signing of this Contract.

Minimum Limits of Insurance

Workers' Compensation:	Statutory Limits
Employer's Liability:	**$1,000,000** Bodily Injury by Accident – Each Accident
	$1,000,000 Bodily Injury by Disease – Each Employee
	$1,000,000 Bodily Injury by Disease – Policy Limit

Coverage Form

Coverage shall be at least as broad as the unmodified National Council on Compensation Insurance (NCCI) Workers Compensation and Employer's Liability coverage form WC 00 00 07/11 or substitute form providing equivalent coverage.

Waiver of Subrogation Endorsement

Contractor and its insurer agree to waive their rights of subrogation for any payments made under this coverage. A policy endorsement at least as broad as the unmodified NCCI Waiver of Our Right to Recover From Others endorsement WC 00 03 13 04/84 or a substitute form providing equivalent coverage is required waiving the insurer's right to recover payments from the City.

OTHER INSURANCE COVERAGES (IF APPLICABLE)

Professional Liability Insurance (if Applicable) $1,000,000 per occurrence limits of liability or whatever limit is customarily carried by the Contractor, whichever is greater, for design, design-build or any type of professional services with a minimum of three (3) years reporting of claims following completion of the project.

Contractors Pollution Liability Insurance (If Applicable)- $1,000,000 per occurrence and $2,000,000 aggregate or whatever amount is acceptable to the City for any exposure to "hazardous materials" as this term is defined in applicable law, including but not limited to waste, asbestos, fungi, bacterial or mold.

Lower tier sub-subcontractors, Truckers, Suppliers: Evidence confirming lower tier subcontractors, truckers and suppliers are maintaining valid insurance prior to beginning work on the project to meet the requirements set forth herein on Subcontractor, including but not limited to all additional insured requirements of Subcontractor.

ALL COVERAGES

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, or non-renewed by either CONTRACTOR or by the insurer, reduced in coverage or in limits except after thirty (30) days' prior written notice has been given to CITY except for nonpayment of premium.

OTHER INSURANCE PROVISIONS

Should City and Contractor agree that higher coverage limits are needed warranting a project policy, project coverage shall be purchased and the premium for limits exceeding the above amount may be borne by City. City retains the option to purchase project insurance through Contractor's insurer or its own source.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to City, its officers, agents, employees, or volunteers.

ACCEPTABILITY OF INSURERS
Insurance is to be placed with insurers with a Best's rating of no less than A-VII and acceptable to the City.. City, with the approval of the Risk Manager, may accept coverage with carriers having lower Best's ratings upon review of financial information concerning Contractor and insurance carrier. City reserves the right to require that Contractor's insurer be a licensed and admitted insurer in the State of Nevada, or on the Insurance Commissioner's approved but not admitted list.

VERIFICATION OF COVERAGE
Contractor shall furnish City with certificates of insurance and with original endorsements affecting coverage required by this contract. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

Prior to the start of any Work, Contractor must provide the following documents to City of Sparks, Attention: Purchasing Division, P.O. Box 857, Sparks, NV 89432-0857:

A. Certificate of Insurance. Contractor must provide a Certificate of Insurance form to the City of Sparks to evidence the insurance policies and coverage required of Contractor.

B. Additional Insured Endorsements. An original Additional Insured Endorsement, signed by an authorized insurance company representative, must be submitted to the City of Sparks, by attachment to the Certificate of Insurance, to evidence the endorsement of the City of Sparks as additional insured.

C. Policy Cancellation Endorsement. Except for ten days notice for non-payment of premium, each insurance policy shall be endorsed to specify that without thirty (30) days prior written notice to the City of Sparks, the policy shall not be cancelled, non-renewal or coverage and/or limits reduced or materially altered, and shall provide that notices required by this paragraph shall be sent by certified mailed to the address specified above. A copy of this signed endorsement must be attached to the Certificate of Insurance.

D. Bonds (as Applicable). Bonds as required and/or defined in the original bid documents.

All certificates and endorsements are to be addressed to the City of Sparks, Purchasing Division and be received and approved by City before work commences. The City reserves the right to require complete certified copies of all required insurance policies at any time.

SUBCONTRACTORS
Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to all of the requirements stated herein.

MISCELLANEOUS CONDITIONS
1. Contractor shall be responsible for and remedy all damage or loss to any property, including property of City, caused in whole or in part by Contractor, any Subcontractor, or anyone employed, directed, or supervised by Contractor.
2. Nothing herein contained shall be construed as limiting in any way the extent to which Contractor may be held responsible for payment of damages to persons or property resulting from its operations or the operations of any Subcontractors under it.

3. In addition to any other remedies City may have if Contractor fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, City may, at its sole option:
    a. Purchase such insurance to cover any risk for which City may be liable through the operations of Contractor under this Agreement and deduct or retain the amount of the premiums for such insurance from any sums due under the Agreement;
    b. Order Contractor to stop work under this Agreement and/or withhold any payments which become due Contractor here under until Contractor demonstrates compliance with the requirements hereof; or,
    c. Terminate the Agreement.

29. Safety Program:

Upon award, the Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. The Contractor shall take all necessary precautions for the safety of, and shall provide all necessary protection to prevent damage, injury, or loss to:

1. All employees on the work site and all other persons who may be affected thereby.
2. All the work, materials, and equipment to be incorporated therein, whether in storage on or off the site.
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

Contractor shall comply with all applicable laws, ordinances, rules, regulations, and others of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. He shall erect and maintain, as required by existing conditions and progress on the work, all necessary safeguards for safety and protection, including posting danger signs, other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities. Contractor shall comply with OSHA'S Hazard Communication Standards.

Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent unless otherwise designated in writing by Contractor to the Owner and the Engineer.

30. Award of Contract:

(a) Bids/Proposals will be analyzed and award will be made to the lowest, responsive and responsible bidder whose bid conforms to the solicitation and whose bid is considered to be most advantageous to the City, price and other factors considered. Factors to be considered may include, but are not limited to: bidder's past performance, total unit cost, economic cost analysis, life cycle costs, warranty and quality, maintenance cost, durability, the operational requirements of the City and any other factors which will result in the optimum economic benefit to the City.

(b) The City reserves the right to reject any item or items, to waive informalities, technical defects and minor irregularities in bids/proposals received; and to select the bid(s) or proposal(s) deemed most advantageous to the City. Should the City elect to waive a right it will not constitute an automatic waiver of that right in the future nor will it impact any other right or remedy. The City may consider bids/proposals submitted on an "all or nothing" basis if the bid/proposal is clearly designated as such.

(c) The City reserves the right to award one or more contracts on the bids/proposals submitted, either by award of all items to one bidder or by award of separate items or groups of items to various bidders as the interests of the City may require, unless the bidder clearly specifies otherwise in his bid.

(d) Upon acceptance by the City of Sparks, the solicitation, bid, proposal, or price quotation and issuance of a purchase order issued to the successful bidder shall be deemed to result in a binding contract incorporating those terms and these General Conditions without further action required by either party. Items are to be furnished as described in the bid and in strict conformity with all instructions, conditions, specifications, and provisions in the complete contract, as defined by this clause or any related integrated agreement.

31. Request for Proposal (RFP) Submittals:

In the case of Request for Proposals (RFP's), it should be noted that the documents submitted by prospective bidders are competitive sealed proposals and not competitive sealed bids. When proposals are opened, prices and other information will not be made public until the proposal is awarded. There shall be no disclosure of any bidder's information to competing bidders prior to the award of the proposal.

By their nature, proposals will include a number of variables that will vary based on the complexity of the product or service addressed within the proposal. Therefore, the evaluation of RFP's and the recommendation for award will not be based on price alone. Selection criteria will be better defined for each scope of work in the Special Conditions section of this bid.

Upon award of the contract, the executed contract and proposals will become public information. Accordingly, each proposal should be submitted on the vendor's most favorable terms from a price and technical standpoint.

32. Bidder Preference Law (This Section ☒ IS ☐ IS NOT Applicable to this bid):

This project will be bid and awarded under the Provisions(s) of NRS 338.147, which restricts preference given to certain contractors on Public Works Projects. The NRS cited in this section is meant to be a reference only. Each bidder shall acquaint himself with the latest provisions of NRS 338.147.

If the Contract for any Public Works Construction Project is expected to cost $250,000 or more, then all Contractors wishing to receive benefit of their preference status in the evaluation of bids must submit a copy of their Certificate of Bidder Preference issued by the State Contractor's Board. (Call 775-688-1141 or 775-486-1100 to obtain certification information from the State Contractors Board). Contractors who do not submit a preference certificate at the time of their bid are presumed to have wished not to exercise the benefit of their preference, or do not possess the certificate of eligibility.

To the extent Contractor has sought, qualified and receives a bidding preference on this project, pursuant to Nevada Revised Statutes Chapter 338, Contractor acknowledges and agrees that the following requirements will be adhered to, documented and attained for the duration of the Project:

1. At least 50 percent of the workers employed on the Project (including subcontractors) hold a valid driver's license or identification card issued by the Nevada Department of Motor Vehicles;

2. All vehicles used primarily for the public work will be (a) registered and (where applicable) partially apportioned to Nevada; or (b) registered in Nevada; and

3. The Contractor shall maintain and make available for inspection within Nevada all payroll records

related to the Project.

Contractor recognizes and accepts that failure to comply with any requirements herein shall be a material breach of the contract and entitle the City of Sparks to liquidated damages in the amount set by statute. In addition, the Contractor recognizes and accepts that failure to comply with any requirements herein may lose its certification for a preference in bidding and/or its ability to bid on any contracts for public works pursuant to NRS Chapter 338.

To the extent Contractor has sought, qualified and receives a bidding preference, and this project has a value of over $250,000 pursuant to Nevada Revised Statutes Chapter 338, each contract between the contractor, applicant or design-build team and a subcontractor must provide for the apportionment of liquidated damages assessed pursuant to this section if a person other than the Contractor was responsible for the breach of a contract for a public work caused by a failure to comply with a requirement of Items 1-3 within this section. The apportionment of liquidated damages must be in proportion to the responsibility of each party for the breach.

This section shall not be applicable for projects in which some or all of the funding comes from Federal sources.

33. Tie Bids:

Should identical low, responsive and responsible bids be received from two bidders, the City of Sparks Purchasing Manager shall notify all parties involved in the tie and may at his option utilize a coin-flip to determine the low bidder who shall be recommended for award. Or;

Should there be three or more low, responsive and responsible tie bids the Purchasing Manager shall exercise the following tie breaking method, unless another alternative is apparent and prudent: The City of Sparks Purchasing Manager shall set a mutually agreed upon time where, in his office, he shall shuffle a new deck of playing cards and have each bidder's representative cut the cards. The tie bidder who cuts the highest card (with Ace high) shall be recommended for bid award.

34. Appeals/Protests – Bids Only (Not Applicable to Request for Proposals):

A person who submits a bid on a contract may, after the bids are opened and within 5 business days after the date the "Recommendation to Award" is issued by the City, unless otherwise stated in the Special Conditions, file a notice of protest regarding the awarding of the contract. The City's "Recommendation to Award" will be dated and posted on the City's public website within the area where bid notices and bid re-caps are posted (Currently: http://www.cityofsparks.us/departments/financial-services/purchasing/bids-rfps).

(a) A notice of protest must include a written statement setting forth with specificity the reasons the person filing the notice believes the applicable provisions of law were violated.

(b) A person filing a notice of protest may be required by the governing body or its authorized representative, at the time the notice of protest is filed, to post a bond with a good and solvent surety authorized to do business in this State or submit other security, in a form approved by the governing body or its authorized representative, to the governing body or its authorized representative who shall hold the bond or other security until a determination is made on the protest. A bond posted or other security submitted with a notice of protest must be in an amount equal to the lesser of:

(1) Twenty-five percent of the total value of the bid submitted by the person filing the notice of protest; or

(2) Two hundred fifty thousand dollars ($250,000).

(c) A notice of protest filed in accordance with the provisions of this section operates as a stay of action in relation to the awarding of any contract until a determination is made by the governing body or its authorized representative on the protest.

(d) A person who submits an unsuccessful bid may not seek any type of judicial intervention until the governing body or its authorized representative has made a determination on the protest and awarded the contract.

(e) A governing body or its authorized representative is not liable for any costs, expenses, attorney's fees, loss of income or other damages sustained by a person who submits a bid, whether or not the person files a notice of protest pursuant to this section.

(f) If the protest is upheld, the bond posted or other security submitted with the notice of protest must be returned to the person who posted the bond or submitted the security. If the protest is rejected, a claim may be made against the bond or other security by the governing body or its authorized representative in an amount equal to the expenses incurred by the governing body or its authorized representative because of the unsuccessful protest. Any money remaining after the claim has been satisfied must be returned to the person who posted the bond or submitted the security.

35. Documentation:

Due to the time constraints that affect contract performance, all required documents, certificates of insurance and bonds shall be provided to the City within ten (10) calendar days following award or date of request by City, whichever is later. Any failure to comply may result in bid being declared non-responsive and rejected, and at City's option, the bid bond may be attached for damages suffered.

36. Discounts:

(a) Prompt payment discounts will not be considered in evaluating bids for award. However, offered discounts will be taken if payment is made within the discount period, even though not considered in the evaluation of bids.

(b) In connection with any discount offered, time will be computed from date of delivery and acceptance, or invoice receipt, whichever is later. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the City check.

(c) Any discount offered other than for prompt payment should be included in the net price quoted and not included in separate terms. In the event this is not done, the City reserves the right to accept the discount offered and adjust prices accordingly on the Purchase Order.

37. Seller's Invoice:

Invoices shall be prepared and submitted in duplicate to the address shown on the Purchase Order. Separate invoices are required for each Purchase Order. Invoices shall contain the following information: Purchase Order number, item number, description of supplies or services, sizes, unit of measure, quantity, unit price and extended totals.

38. Inspection and Acceptance:

Inspection and acceptance will be at destination unless specified otherwise, and will be made by the City department shown in the shipping address or other duly authorized representative of the City. Until delivery and acceptance, and after any rejection, risk of loss will be on the bidder unless loss results from negligence of the City.

39. Lost and Damaged Shipments:
Risk of loss or damage to items prior to the time of their receipt and acceptance by the City is upon the bidder. The City has no obligation to accept damaged shipments and reserves the right to return at the bidder's expense damaged merchandise even though the damage was not apparent or discovered until after receipt of the items.

40. Late Shipments:
Bidder is responsible to notify the City department receiving the items and the Purchasing Manager of any late or delayed shipments. The City reserves the right to cancel all or any part of an order if the shipment is not made as promised.

41. Document Ownership:
All technical documents and records originated or prepared pursuant to this contract, including papers, reports, charts, and computer programs, shall be delivered to and become the exclusive property of the City and may be copyrighted by the City. Bidder assigns all copyrights to City by undertaking this agreement.

42. Advertisements, Product Endorsements:
City employees and agencies or organizations funded by the City of Sparks are prohibited from making endorsements, either implied or direct, of commercial products or services without written approval of the City Manager. No bidder may represent that the City of Sparks has endorsed their product or service without prior written approval.

43. Optional Cooperative Purchase Agreement
It is intended that any other public agency (i.e., city, county, district, public agency, municipality or state agency) shall have the option to participate (A.K.A. "join" or "piggyback") in any award made as a result of this solicitation. The City of Sparks shall incur no financial responsibility in connection with purchase orders or contracts made by the bidder with another public agency resulting from this solicitation. The public agency utilizing the original contract shall accept sole responsibility for placing orders and making applicable payments to the vendor. Should the Bidder not wish for a contract resulting from this bid to be used by other public agencies, they have the option to decline that option at the time of request.

44. Vendor Workplace Policies
No Vendor providing a service, program or activity to the public on behalf of the City shall discriminate against any person because of sex, race, color, creed, national origin or disability. Vendor, if providing a service, program or activity to the public on behalf of the City, shall comply with the Americans with Disability Act and City's policies pursuant thereto when providing said service, program or activity.

The City of Sparks is an Affirmative Action/Equal Opportunity Employer. Bidders shall be cognizant of the requirements for compliance with Executive Order 11246, entitled "Equal Employment Opportunity" as amended by Executive Order 11375 and as supplemented in regulations of the U.S. Department of Labor (41 CFR part 60).

45. Business License Requirement:
All companies doing business with, or within, the City of Sparks are required to obtain and maintain a current business license from the City of Sparks prior to the commencement of work per Sparks Municipal Code Section 5.08.020A. Bidder(s) awarded a contract resulting from this bid shall be required to obtain a current business license if they do not already possess one.

46. City Provisions to Prevail:
Except as indicated in the specifications, the City's standard General Conditions shall govern any contract award. Any standard terms and conditions of bidder submitted by bidder shall not be acceptable to City unless expressly agreed to by the City. The City reserves the right to reject bidder's bid as non-responsive, to consider the bid without bidder's standard terms and conditions, or to require bidder to delete reference to such, as a condition of evaluation or award of the bid. If, after award of contract, bidder (contract vendor) provides materials or services accompanied by new or additional standard terms or conditions, they too shall be considered void and City may require deletion as a further condition of performance by vendor.

47. Invalid Provisions:
In the event that any one or more of the provisions of this agreement shall be found to be invalid, illegal or unenforceable, the remaining provisions shall remain in effect and be enforceable.

48. Amendments and Modifications:
The Purchasing Manager may at any time, by written order, and without notice to the sureties, make a modification to the contract or an amendment to the Purchase Order, within the general scope of this contract, in (1) quantity of materials or service, whether more or less; (2) drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the City; (3) method of shipment or packing; and (4) place of delivery. If any such change causes an increase or decrease in the cost or the time required for the performance of this contract, an equitable adjustment shall be made by written modification of the contract or amendment to the Purchase Order. Any claim by the bidder for adjustment under this clause must be asserted within 30 calendar days from the notification date.

49. Assignment:
Vendor shall not assign or delegate duties or responsibilities under this agreement, in whole or in part, without prior written approval of the City.

50. Disputes After Award:
Except as otherwise provided in these provisions, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Purchasing Manager, who shall reduce this decision to writing and mail a copy to the bidder. The decision of the Purchasing Manager shall be final and conclusive, unless bidder requests arbitration within ten (10) calendar days. Pending final decision of a dispute, the bidder shall proceed diligently with the performance of the contract and in accordance with the Purchasing Manager's decision.

51. Arbitration after Award:
Any and all disputes, controversies or claims arising under or in connection with the contract resulting from this bid, including without limitation, fraud in the inducement of this Contract, or the general validity or enforceability of this Contract, shall be governed by the laws of the State of Nevada without giving effect to conflicts of law principles, may be submitted to binding arbitration before one arbitrator, and shall be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association in a private manner in Washoe County, Nevada. This award shall be final and judgment may be entered upon it in any court having jurisdiction thereof. In reaching this final award, the arbitrator shall have no authority to change or modify any provision of this Contract. All other expenses of arbitration shall be borne equally by the parties. All fees, including legal fees, shall be borne by the party who incurred them. All costs of enforcement shall be borne by the losing party. Each party shall have the right to discovery in accordance with the Nevada Rules of Civil Procedure.

52. Lawful Performance:
Vendor shall abide by all Federal, State and Local Laws, Ordinances, Regulations, and Statutes as may be related to the performance of duties under this agreement. In addition, all applicable permits and licenses required shall be obtained by the vendor, at vendor's sole expense.

53. Annual Appropriation of Funds:
Multi-year term supply and service contracts and leases are subject to annual appropriation of funds by the City Council. The City plans and makes appropriations to the City Budget with respect to a fiscal year that starts July 1st and ends June 30th of each year. Payments made under term contracts and leases are considered items of current expense. Purchase Orders are funded when issued; therefore, they are current expense items and are not subject to any subsequent appropriation of funds.

Continuance of a multi-year contract beyond the limits of funds available shall be contingent upon appropriation of the requisite funds in the ensuing fiscal year and the termination of this contract due to lack of appropriation shall be without penalty.

54. Extension:
When in the City's best interest, this agreement may be extended on a daily, month-to-month, or annual basis by mutual agreement of both parties. Services and/or materials received under an extension shall be in accordance with pricing, terms, and conditions, as described herein.

55. Termination:
The City may terminate this agreement and be relieved of any consideration to the vendor should vendor fail to perform in the manner required. Furthermore, the City may terminate this agreement for any reason without penalty upon giving thirty (30) days written notice to the vendor. In the event of termination, the full extent of City liability shall be limited to an equitable adjustment and payment for materials and/or services authorized by and received to the satisfaction of the City prior to termination.

56. Venue:
This agreement shall be governed by and interpreted according to the laws of the State of Nevada, and venue for any proceeding shall be in Washoe County.

Special Conditions and Specifications
(Specific to Project)

In instances where the Special Conditions conflict with the General Conditions, the Special Conditions will prevail with respect to that instance or item(s).

SPECIAL PROVISIONS
ROCK PARK RESTROOM PROJECT
Bid #15/16-005 PWP WA-2015-255

These Special Provisions supplement and modify the "Standard Specifications for Public Works Construction" (Orange Book), 2012 Edition (hereinafter "Standard Specifications"), and adopted by the City of Sparks, Nevada. All of the requirements and provisions of said Standard Specifications shall apply except where modified by the City General Conditions, contract forms, plans, technical specifications and these Special Provisions (all contained within this bid document). **Orange Book Section 100.12 Contract- The last paragraph "The Bidder to whom award is made, shall not subcontract more than 50 percent of the total cost of the project", does not apply to the project.**

SECTION 1: SCOPE OF WORK

Work scope: The work includes, but is not limited to construction of a masonry building that will provide restroom facilities at Rock Park, which includes grading, construction, electrical, mechanical and sewer force main, along with all appurtenant work necessary to complete the project as stated in the plans and bid specifications. The location of the work is within the City limits of the City of Sparks, Washoe County, Nevada, and is more specifically designated in the plans for this project.

SECTION 2: NOTICE TO PROCEED AND TIME SCHEDULE

An official "Notice to Proceed" specifying the date by which construction operations shall be started will be issued in writing and delivered to the CONTRACTOR by the City upon approval by the City Council and when all appropriate bonds and contracts have been signed and returned to the City. Contract time will begin on the date specified in the "Notice to Proceed", unless operations begin at an earlier date, in which case the date that such operations begin will apply. The CONTRACTOR shall immediately begin and diligently prosecute the work to completion. The CONTRACTOR shall obligate himself to complete the work within the stated time limits. The CONTRACTOR shall begin work and shall diligently prosecute same to completion of the work from the date of commencement order, without fail and in the manner as stated in said specifications. All work described in this document shall be completed within seventy-five (75) calendar days from the time of issuance of the Notice to Proceed.

SECTION 3: LIQUIDATED DAMAGES

In case all work called for under the contract is not completed before or upon the expiration of the time limits set forth above, it is agreed by the parties to the contract that damage will be sustained by the City and that it will be impracticable to determine accurately the actual damage the City will sustain in the event of any such delay. Therefore, the CONTRACTOR shall pay to the City:

- ONE THOUSAND DOLLARS ($1,000.00) for each and every calendar day delay after the seventy-five (75) calendar day completion time limit.

In finishing the work in excess of the dates prescribed and the City shall further have the right to charge to the CONTRACTOR, his heirs, assigns or sureties and to deduct from the final payment for the work, all or any part as it may deem proper of the actual cost of which are directly chargeable to the contract and which accrue during the period of such extensions, except that the cost of the final surveys and preparation of final estimate shall not be included in such charges

The City may deduct this amount from any money due or that may become due the CONTRACTOR under the contract. This payment shall not be considered as a penalty, but as liquidated damages suffered by the City on account of the failure of the CONTRACTOR to complete the work within the time limit of the contract.

SECTION 4: EXCUSABLE DELAYS

The Contractor shall not be assessed with liquidated damage nor the cost of engineering inspection during any delay in the completion of the work caused by acts of God, the public enemy, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or due to such causes, provided that the Contractor shall within ten (10) days from the beginning of such delay notify the Project Manager in writing of the causes of delay. The Project Manager's findings of the facts thereon shall be final and conclusive.

SECTION 5: INTENT OF THE PLANS AND SPECIFICATIONS

The intent of the plans and specifications is to prescribe a complete outline of work which the Contractor undertakes to do in full compliance with the contract.

He shall furnish all required materials, equipment, tools, labor and incidentals, unless otherwise provided in the contract and shall include the cost of these items in the contract unit prices for the several units of work. All items of work called for on the plans or in the specifications and not included as a separate item in the proposal shall be considered as incidental to the other items listed in the proposal and the payment for such incidental items shall be considered as included in the contract bid.

SECTION 6: AUTHORITY OF THE PROJECT MANAGER AND INSPECTOR

All work shall be done under the supervision of the Project Manager acting on behalf of the City. He shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rates of progress, interpretation of the plans and specifications, acceptable fulfillment of the contract and compensation under the specifications. He shall determine the amount of work performed and materials furnished and his decision and estimate shall be final. His estimate shall be "condition precedent" to the right of the Contractor to receive money due him under the contract. The Project Manager does not have authority to authorize changes in plans and specifications without prior written approval of the Deputy City Manager.

The City shall provide an inspector who will represent the City and the Engineer and shall make inspections of all work and do such other work relative to supervision of the project as he may be assigned by the City. All instructions given by the inspector are subject to approval by the Engineer.

SECTION 7: CHANGE ORDERS

The City of Sparks reserves the right to make alterations or supplements to the Contract. Change Order Forms are required for all changes in decreases and/or increases of quantities and/or dollar amount changes in accordance with the Latest Edition of the Standard Specifications for Public Works Construction (Section 124: Change Orders and Section 153: Increased or Decreased Quantities).

SECTION 8: COOPERATION WITH OTHER CONTRACTORS

The Contractor shall cooperate with other Contractors who may be employed by the City on construction of other work adjacent to or in the proximity of the location of the project.

SECTION 9: WORKING DAY, WORK HOURS, SATURDAY, SUNDAY, HOLIDAY AND OVERTIME WORK

The Contractor shall not perform any contract work on Sunday, legal Holidays and outside of the twelve (12) hours available during a regular working day except as directed and/or approved by the Deputy City Manager and as specified herein. The Contractor shall not commence Construction operations before seven o'clock (7:00 A.M. Pacific Time) each working day except as directed by the Deputy City Manager and as specified herein.

If the Contractor plans to perform work outside of the twelve (12) hours available during a regular working day, the Contractor shall first obtain approval from the Deputy City Manager at least twenty-four (24) hours prior to commencing such overtime work. If the Contractor plans to perform work on Sunday, he/she shall obtain approval by the Thursday prior to work on the Sunday for which work is planned. If the Contractor plans to perform work on a legal Holiday, he/she shall first obtain approval from the Deputy City Manager at least 48 hours in advance.

The Contractor shall be charged for all of City of Sparks' employee(s) time spent for overtime, Saturday, Sunday or Holiday work, based on the employee's hourly rate, plus benefits. The Contractor will be notified of the costs incurred and if the payment is not made, such costs will be deducted from any payment due to the Contractor.

The Contractor's normal working hours shall be from 7:00 A.M. until 7:00 P.M., Monday through Saturday unless otherwise required by these specifications or approved in writing by the Deputy City Manager when requested in writing by the Contractor, excluding but not limited to, the following legal Holidays, recognized by the City of Sparks:

January 1	New Year's Day
3rd Monday in January	Martin Luther King, Jr.'s Birthday
3rd Monday in February	President's Day
Last Monday in May	Memorial Day
July 4	Independence Day
1st Monday in September	Labor Day
Last Friday in October	Nevada Day
November 11	Veteran's Day
4th Thursday in November	Thanksgiving Day
4th Friday in November	Family Day (day after Thanksgiving)
December 25	Christmas Day

SECTION 10: CLEANUP

At completion of the work day, the Contractor will clean up all waste materials, excess materials, trash or other construction completed. Liquidated damages as specified in Section 3 of these specifications, will not be imposed provided that the Contractor is making a reasonable effort to complete clean up in as short a time possible.

SECTION 11: FORCE ACCOUNT

Force Account items as defined by the City of Sparks will be additions to the contract arising within the course and scope of the contract for incidental costs due to unforeseen circumstances.

Any force account items shall be adjusted daily upon report sheets, furnished to the Engineer by the Contractor and signed by both parties. These daily reports shall thereafter be considered the true record of force account items for unforeseen circumstances. No additional incidental work shall be performed or made except upon a written order from the Engineer.

SECTION 12: CONTRACTOR AND SUBCONTRACTOR RESPONSIBILTY, QUALIFICATIONS, AND LICENSE.

The Contractor and Subcontractors shall hold current licenses from the Nevada State Contractors Board. Licenses shall be of the proper classifications and sub-classifications required to perform the Work as specified in Nevada Administrative Code (NAC) 624.

Project Manual
Plan Review/Bid Documents

Rock Park
Restroom and Storage Building

Bid # 15/16-005
PWP # WA-2015-255
July 27, 2015

H+K ARCHITECTS

5485 Reno Corporate Drive, Suite 100
Reno, Nevada 89511-2262

P 775+332+6640
F 775+332+6642

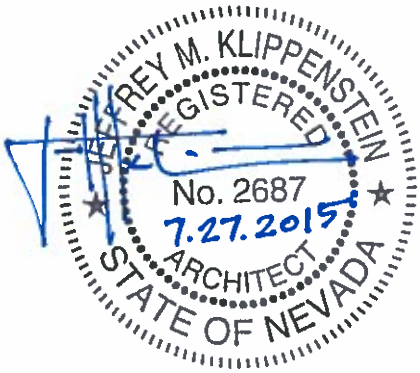
hkarchitects.com

SECTION 00 00 01 – PROJECT DIRECTORY

July 27, 2015

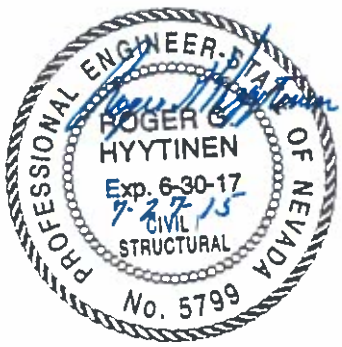
OWNER
City of Sparks
431 Prater Way
Sparks, NV 89431
(775) 353-4083
(775) 353-1635 (fax)
Contact: Richard W. Brookes
Email: rbrookes@cityofsparks.us

ARCHITECTURE
H+K Architects
5485 Reno Corporate Drive, Suite 100
Reno, NV 89511-2262
(775) 870-4877
(775) 332-6642 (fax)
Contact: Jeff Klippenstein, AIA
Email: jeff@hkarchitects.com



STRUCTURAL ENGINEERING
Hyytinen Engineering
5458 Longley Lane, Suite B
Reno, NV 89511
(775) 826-3019
(775) 826-3076 (fax)
Contact: Jeremy Will, SE
Email: JWill@hyytinenenginering.com

MECHANICAL ENGINEERING
Ainsworth Associates Mechanical Engineer
1420 Holcomb Avenue, Suite 201
Reno, NV 89502
(775) 329-9100
(775) 329-9105 (fax)
Contact: Steven Ainsworth
Email: sainsworth@aa-me.com



SECTION 00010 - PROJECT SPECIFICATIONS INDEX

DIVISION 9 FINISHES
- 092900 Gypsum Board
- 099113 Exterior Painting
- 099123 Interior Painting
- 099300 Staining & Transparent Finishing
- 099600 Anti-Graffiti Coatings

DIVISION 10 SPECIALTIES
- 101423 Building Signage
- 102113 Toilet Compartments
- 102800 Toilet and Bath Accessories
- 104413 Fire Protection Cabinets
- 104416 Fire Extinguishers

DIVISION 11 EQUIPMENT
Not Used

DIVISION 12 FURNISHINGS
Not Used

DIVISION 13 SPECIAL CONSTRUCTION
Not used

DIVISION 14 CONVEYING SYSTEMS
Not used

DIVISION 22 PLUMBING
- 220000 Plumbing
- 220100 Operation and Maintenance Plumbing
- 220500 Common Work Results for Plumbing
- 220700 Plumbing Insulation
- 221000 Facility Water Distribution
- 221300 Facility Sanitary Sewerage
- 224000 Plumbing Fixtures and Trim

DIVISION 23 MECHANICAL
- 230700 HVAC Insulation
- 233100 HVAC Ducts
- 233700 Air Outlets and Inlets

DIVISION 26 ELECTRICAL
See Drawings

DIVISION 31 EARTHWORK
- 312001 Structural Earthwork

DIVISION 32 EXTERIOR IMPROVEMENTS
See Civil Drawings

END OF SECTION

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Rock Park Restroom and Storage Building.

1. Project Location: 1515 South Rock Blvd., Sparks, NV 89502.

B. Owner: City of Sparks, 431 Prater Way, Sparks, NV 89432.

1. Owner's Representative: Brian Cason, Capital Projects Manager, 775-353-4083, bcason@cityofsparks.us

C. Architect: H+K Architects, 5485 Reno Corporate Drive, Suite 100, Reno, NV 89511.

1. Jeff Klippenstein, AIA; 775-870-4877; jeff@hkarchitects.com

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of, but is not limited to the following:

1. 768 square foot Restroom/Storage building: Concrete footings, slab-on-grad, non-insulated CMU exterior walls, wood trusses, metal roof, hollow metal doors and frames, electronic door hardware, interior finishes, solid plastic toilet partitions, plumbing, HVAC, and electrical.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits: Confine construction operations to area of work as shown on drawings.
2. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.6 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing facilities during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit on site to normal business working hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday, unless otherwise indicated.

1. Weekend Hours/Holidays: Weekend work not allowed on Sunday. Work not allowed on Holidays recognized by the City of Sparks.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.

2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Contingency allowances.

1.3 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

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.

END OF SECTION 012100

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    e. Quotation Form: Use forms acceptable to Architect.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Proposal Request Form: Use form acceptable to Architect.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.
b. Submittal schedule.
c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

    a. Project name and location.
    b. Contractor's name and address.
    c. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Name of subcontractor.
    d. Name of manufacturer or fabricator.
    e. Name of supplier.
    f. Change Orders (numbers) that affect value.
    g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

        1) Labor.
        2) Materials.
        3) Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Submit Application for Payment to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. List of Contractor's staff assignments.
5. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
6. Certificates of insurance and insurance policies.
7. Performance and payment bonds.
8. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Evidence that claims have been settled.
5. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Requests for Information (RFIs).

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for approval of Contractor's means and methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's construction schedule.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting schedules and reports.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. PDF electronic file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than 7 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include not more than 14 days for completion of punch list items and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Work Restrictions: Show the effect of the following items on the schedule:

a. Limitations of continued occupancies.
b. Uninterruptible services.
c. Use of premises restrictions.
d. Seasonal variations.
e. Environmental control.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 14 days after date established for the Notice to Proceed.

a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.

C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

a. Preparation and processing of submittals.
b. Purchase of materials.
c. Fabrication.
d. Installation.
e. Punch list and final completion.
f. Activities occurring following final completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. When revisions are made, distribute updated schedules 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 performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled date of fabrication.
    h. Scheduled dates for purchasing.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

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

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner,containing the following information:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name of Contractor.
    e. Name of firm or entity that prepared submittal.
    f. Names of subcontractor, manufacturer, and supplier.
    g. Category and type of submittal.
    h. Submittal purpose and description.
    i. Specification Section number and title.
    j. Specification paragraph number or drawing designation and generic name for each of multiple items.
    k. Drawing number and detail references, as appropriate.
    l. Location(s) where product is to be installed, as appropriate.
    m. Related physical samples submitted directly.
    n. Indication of full or partial submittal.
    o. Transmittal number-numbered consecutively.
    p. Submittal and transmittal distribution record.
    q. Other necessary identification.
    r. Remarks.

E. Options: Identify options requiring selection by Architect.

F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.

3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files.

    a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams showing factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

    a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Notation of coordination requirements.
    d. Notation of dimensions established by field measurement.
    e. Relationship and attachment to adjoining construction clearly indicated.
    f. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches , but no larger than 30 by 42 inches .
3. Submit Shop Drawings in the following format:

    a. PDF electronic file.

D. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

E. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

F. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

G. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

B. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

D. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

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

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch , 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide concrete bases for supporting posts.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

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

3.2 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

3.3 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal.

B. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been 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 temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 012100 "Allowances" for products selected under an allowance.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project 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 Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

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

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved."

B. Product Selection Procedures:

1. Products:

   a. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements.

2. Manufacturers:

   a. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
3. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

a. Irrigation Control systems.
b. Underground Communication systems.
c. Underground Electrical wiring systems.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

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

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

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

C. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."

D. Existing Utility Services and Control/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Proceed with patching after construction operations requiring cutting are complete.

F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

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

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 017300 "Execution" for progress cleaning of Project site.
2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit test/adjust/balance records.
5. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
6. Complete final cleaning requirements, including touchup painting.
7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.

4. Submit list of incomplete items in the following format:

   a. PDF electronic file. Architect will return annotated file.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark 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 Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Remove snow and ice to provide safe access to building.
e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
f. Sweep concrete floors broom clean in unoccupied spaces.
g. Remove labels that are not permanent.
h. Wipe surfaces of mechanical and electrical equipment**[, elevator equipment,]** and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
i. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
j. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
k. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
l. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
m. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation manuals for systems, subsystems, and equipment.
2. Product maintenance manuals.
3. Systems and equipment maintenance manuals.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer Comments on draft submittals.

2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return three copies.

C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment

names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Operating standards.
3. Operating procedures.
4. Wiring diagrams.
5. Control diagrams.
6. Piped system diagrams.
7. Precautions against improper use.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.

4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.

B. Related Requirements:

1. Section 017300 "Execution" for final property survey.
2. Section 017700 "Closeout Procedures" for general closeout procedures.
3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.

a. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

B. Format: Submit record Specifications as paper copy.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected site elements.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner [**ready for reuse**].

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1. Comply with requirements specified in Section 013233 "Photographic Documentation."
2. Inventory and record the condition of items to be removed and salvaged. Provide [**photographs**] [or] [**video**] of conditions that might be misconstrued as damage caused by salvage operations.

3.2 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

3.3 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.5 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 031000 - CONCRETE FORMWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. General Requirements:

1. Drawings and general provisions of the Contract Documents including General, Special and other Conditions and Division 01, “General Requirements” Sections, apply to the work specified in this Section.

B. General Scope of Work:

1. Provide formwork and accessories in accordance with provisions of this Section for cast-in- place concrete shown on the Drawings or required by other Sections of these Specifications.

C. Related work:

1. Section 032000: Concrete reinforcement.
2. Section 033000: Cast-in-place concrete.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Design of formwork is the Contractor's responsibility.

C. Standards:

1. Concrete work shall comply with the requirements of ACI 301, “Specifications for Structural Concrete for Buildings”, latest edition.
2. Items not otherwise specified shall comply with ACI Standard 347, “Recommended Practice for Concrete Formwork”, latest edition.

D. Allowable Tolerances in Formwork:

1. Construct formwork to provide completed cast-in-place concrete surfaces 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 location 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.
4. Refer to Structural Drawings for additional requirements.

E. Inspections:

1. See drawings and general provisions of the Contract Documents including General, Special and other Conditions and Division 01, “General Requirements” Sections, apply to the work specified in this Section.
2. See requirements for inspection as stated in Part 3 of this section.

1.3 SUBMITTALS

A. Submit manufacturer's specifications and installation instructions for products specified. Include manufacturer’s certification as may be required to show compliance with these specifications.

1.4 JOB CONDITIONS

A. LOADING STRUCTURES

1. Protect all in-place structures from excessive loading.
2. Shore and brace as necessary to prevent all damage.

B. SCHEDULING

1. Contractor shall provide and erect sufficient forms so that the work of placing concrete will proceed at a rate to insure maintaining a schedule so that the time of the inspector shall be as continuous as practicable.

PART 2 - PRODUCTS

2.1 MATERIALS

A. GENERAL

1. Except for metal forms, use new materials. Materials may be re-used during progress of the Work, provided they are completely cleaned and reconditioned, recoated for each use, and capable of producing formwork of the required quality.

B. EARTH FORMS

1. Side forms for footings may be omitted, and concrete may be placed directly against excavation, only when requested by Contractor and approved by Architect, in writing. The Architect shall be the sole authority for making this approval.
2. When omission of forms is accepted, provide additional concrete 1” on each side of the minimum design profiles and dimensions shown on Structural Drawings.

C. FORM MATERIALS

1. Plywood:

a. APA Exterior “B-B” “Plyform” grade Douglas Fir veneer panel with medium density overlaid one side grade; sound, undamaged sheets with clean, true edges; conform to Product Standard PS 1. Use for all exposed concrete surfaces.
b. Panel thickness and placing as required to support concrete in accordance with referenced standards; minimum ¾” thickness.
c. All panels edge sealed; Both faces of general use panels shall be factory sealed with colorless coating which will not affect application of applied finishes or protective coatings; form oil not permitted.

2. Lumber for Forms:
   a. For concealed concrete surfaces including footings and foundations, use “Standard” or better grade Douglas Fir, T&G or shiplap, surface 1 side, 2 edges, not wider than 8”, secured to wood or steel stakes, substantially constructed to shapes indicated and to support the required loads.
   b. For studs, wales, and supports, use S4S surfaced “Standard” or better grade Douglas Fir lumber, dimensions as required to support the loads, but not less than 2x4 inch size.
3. Flat Steel Forms:
   a. Approved type steel forms may be used in lieu of wood and plywood, at the Contractor’s option.
4. Tube Forms:
   a. For round columns furnish fiber, fiberglass, or metal tube forms of diameters required, capable of withstanding continuous pour full height and providing a finished surface free of spiral markings.

D. ACCESSORIES

1. Form Ties:
   a. Removable form bolts with coil ties, or snap ties.
   b. Either system shall have cone spreaders and tie metal shall be ¾” minimum back of concrete face.
   c. As manufactured by Superior Concrete Accessories, Burke, Richmond, or approved equal.
2. Screed Chairs:
   a. Approved type for slab screeds.
3. Chamfer Strips:
   a. Wood or PVC strips, ¾ x ¾ inch size of maximum possible lengths.
4. Control Joints:
   a. For interior slabs, where not otherwise provided by saw cutting, furnish Greenstreak Plastic Products “Zipcap Control-joint Former”, or approved, minimum 10-foot lengths, 1” depth for installation in new interior slabs.
5. Expansion Joints:
   a. For Interior Slabs: Meadows “Seal Tight” self-expanding cork, ½” thick by depth of slab less ¼”, conforming to ASTM D1752, Type 3 (AASHTO M153-Type II), or approved equal.
6. Nails, Spikes, Lag Bolts, Thru-Bolts, Anchorages:
   a. Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
7. Joint Sealant:
   a. As specified in Section 033000.

E. TREATMENT OF FORMS

1. Furnish W. R. Meadows, Inc. “Sealtight Duogard”, Nox-crete Chemical “Nox-crete Form Coating”, Sternson Ltd. “CRA”, or Old North Mfg. Co. Inc. or Sonneborn-Contech or

Metalcrete Industries equivalent chemical release agent, as approved, guaranteed as non- staining and not impairing bond of paints or other coatings.

2. Form release agent may be factory-applied provided release agent conforms to these requirements; form oil not permitted.

2.2 DESIGN OF FORMWORK

A. General:

1. Design formwork so it will safely support vertical and lateral loads that might be applied. Design forms and falsework to include factors pertinent to safety of the structure during construction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

B. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:

1. Install concrete work in accordance with ACI 301 except as amended by this Section.

B. Earth Forms:

1. Where permitted, hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

C. Construction - Formwork:

1. General:
   a. Construct formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 347. Construct so concrete members and structures are of correct sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, level, and plumb work in the finished structure.
   b. Make reasonably tight to prevent excess leakage of cement paste during concrete placement. Solidly butt joints, and provide backup material at joints as required to prevent leakage and prevent fins. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to over-stressing by construction loads.
   c. Set form board and plywood for walls horizontally; keep form joints to a minimum.

d. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features as required.
e. Remove debris and clean out forms before pouring any concrete.
f. Keep forms moist prior to pour to prevent shrinkage and warping.
g. Do not damage concrete during stripping. Permit removal of remaining principal shores.

2. Fabrication:
   a. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
   b. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
   c. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and assure ease of removal.
   d. Locate studs and joists not farther apart than 12 inches o.c. Horizontal form wales spaced not to exceed 2 feet o.c.
3. Form Ties:
   a. Hold inner and outer forms for vertical concrete together with combination steel ties and spreaders as approved by Architect.
   b. Space wall form ties not over 4 feet apart horizontally and 2 feet apart vertically. Space ties symmetrically in tiers and rows, each tier plumb from top to bottom and each row level. Form tie placement in formed walls where wall surface will be left exposed in the finished work, shall be uniformly spaced and aligned within the following tolerance:
      Tie alignment, horizontally and vertically along each wall plane, shall occur no more than ¼" from a straight line measured between first and last tie along any line, and no more than ¼" variance in alignment between any to adjacent ties.
   c. At horizontal pour lines, locate ties not more than 6" below the pour lines. Tighten after concrete has set and before the next pour is made.
   d. For exposed concrete surfaces, install form ties of removable type with she-bolts equipped with permanent plugs and a system approved by Architect for fixing the plug in place.
4. Forms for Exposed Concrete:
   a. Drill forms to suit ties being used, and to prevent leakage of cement paste around the holes. Do not splinter forms by driving ties through improperly prepared holes.
   b. Provide sharp clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.
   c. Use extra studs, wales, and bracing to prevent objectionable bowing of forms between studs, and to avoid bowed appearance in concrete. Do not use narrow strips of form material which will produce bow.
5. Column Forms:
   a. For square or rectangular columns, use 2" thick planks or joists, surfaced one side and two edges; or use metal forms.
   b. For round columns, use tube forms as specified above, which will impart a smooth architectural finish as directed and approved by Architect.
   c. Construct column forms with tight joints and securely clamped together with steel clamps.
6. Corner treatment:
   a. Chamfer salient corners in exposed concrete unless otherwise noted or where flush with adjacent surfaces. Unless shown otherwise, form chamfers with 3/4" x 3/4" strips, accurately formed and surfaced to produce uniformly straight lines and tight edges.
   b. Extend terminal edges to required limit, and miter the chamfer strips at changes in direction.

7. Provisions for Other Trades:
   a. Provide openings in concrete formwork to accommodate work of other trades.
   b. Verify size and location of openings, recesses, and chases with the trade requiring such items.
   c. Accurately place and securely support items to be built into the concrete.
8. Re-use of Plywood:
   a. Plywood forms may be reused provided damaged edges are removed, imperfections in faces are repaired and holes filled and plywood is cleaned to obtain concrete surfaces equal to that obtained by new plywood.

D. TREATMENT OF FORMS

1 Before placing the concrete, the contact surfaces of forms shall be coated with a suitable non-staining form coating compound or shall be given two coats of nitrocellulose lacquer. Mineral oil shall not be used on forms.
2. Excess coating shall be removed by wiping with cloths. Re-used forms shall have the contact surfaces cleaned thoroughly, those which have been coated shall be given an additional application of the coating.
3. Apply form coating material in strict accordance with manufacturer's recommendations.

E. MISCELLANEOUS EMBEDDED ITEMS

1. Anchor Bolts:
   a. Set as required on the drawings.
2. Inserts, Sleeves, Conduit and Similar:
   a. Allow all trades time and facilities to install.
   b. Conform to Section 503 of ACI Building Code and the International Building Code.
   c. General Contractor shall furnish and install all sleeves and frames for openings shown on drawings or required for equipment, except those sleeves specified under the Mechanical and Electrical Work.
3. Bolt Inserts:
   a. Shall be of threaded type to receive standard machine bolt.
   b. Size 5/8" unless larger size is indicated on the drawings.
4. All Other Miscellaneous Items:
   a. Build-in items specified in other Sections exactly where shown.
   b. Verify locations which may be critical.

F. JOINTS AND STOPPAGES

1. Construction Joints:
   a. Install in accordance with ACI 318 and as specified herein. Located where indicated or otherwise required and approved as to not impair strength of structure.
   b. Provide nominal ¾" x 2-1/2" key at construction joints, unless otherwise shown on drawings, or as directed by Structural Engineer.
   c. Make joints perpendicular to principal reinforcement. Continue half reinforcement and mesh across joints except at isolation joints; provide longitudinal keys at least 1-1/2" deep at all joints in walls and between walls and slabs or footings.
   d. Remove key-forming wood inserts and thoroughly clean surface of concrete at all joints, removing all laitance, before placing next lift.
   e. Immediately prior to placing next lift and/or adjacent slab, dampen hardened concrete of joint surface and coat with neat cement mortar of similar proportions to mortar in concrete.
2. Expansion Joints:

a. Do not extend reinforcement trough where bonded on both sides of joint; smooth dowels may extend through joint. Position accurately and support against displacement in locations listed hereinafter.
b. Interior Work:
   i. Install isolation/expansion joints between interior ground-supported slabs and building foundation walls when shown on Drawings, and at other locations where specifically shown or noted.
   ii. Install joints with top surface recessed below finish elevation ¼", and fill with joint sealer as specified in Section 033000, finished flush with slab surface.
c. Exterior Work:
   i. Install as required in new walks and slabs in locations and/or spacings shown, elsewhere not more than 10 feet apart. Coordinate exact locations and alignment with Architect.
   ii. Install expansion joints between concrete walks/slabs and vertical building walls and retaining walls.
   iii. Install at all other locations indicated.
   iv. Install joints with top surface recessed below finish elevation ¼", and fill with joint sealer as specified in Section 033000, finished flush with slab surface.

3. Control Joints:
   a. Provide as detailed and in locations indicated, accurately placed to true straight lines and supported against displacement.
   b. For exterior work, form with edging tool as specified in Section 033000.
   c. For interior work, build control strips into forms or diamond-saw cut joints 1/8" wide by 1/5 the depth of the slab.
      i. If sawing method is used, sawing shall be performed as soon as the concrete hardens sufficiently to prevent raveling of the concrete at the edges and before the concrete temperature is permitted to fall; perform cuts 4 – 8 hours after concrete is placed, as soon as the freshly placed concrete can be walked on.
      ii. Contractor shall have at least one spare saw available during the sawing operation.

G. REMOVING FORMS AND SHORING

1. Ties:
   a. Remove 4 days after pour. Fill holes with dry pack cement mortar as specified in Section 033000.
2. Forms:
   a. Remove only after concrete has thoroughly hardened. Vertical forms may be removed 24 hours after pour where structure is supported on shores. Remove other forms no sooner than 7 days.
3. Shoring:
   a. Remove shoring only on approval of Engineer but not before 28 days.
   b. Shoring is required for any reinforced concrete structural component, except concrete slabs supported by structural steel framing.
   c. Shoring for beams and slabs shall remain in place at all ties until all concrete work over has been completed; if necessary to remove any shoring in order to remove plywood forms, shoring so removed shall immediately be reinstalled to support all loads.
4. Finished Surfaces:
   a. Exercise care in removing forms from finished concrete surfaces so that surfaces are not marred or gouged, and that corners are true, sharp, and unbroken.
   b. Release sleeve nuts or clamps, and pull the form ties neatly.
   c. Do not permit steel spreaders, form ties, or other metal to project from, or be visible on, any concrete surface except where so shown on Drawings.

3.3 FIELD QUALITY CONTROL

A. INSPECTIONS

1. Testing will be performed as required by the International Building Code, as adopted by local jurisdiction, and these Specifications.
2. Inspections of formwork shall include configuration, form, and steel cleanliness.
3. Inspect erected formwork for conformance with approved drawings, for design and seal of form joints, and for type and location of form ties.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Drawings and general provisions of The Contract Documents including General, Supplemental and other Conditions and Division 01, "General Requirements" Sections, apply to the work specified in this Section.

B. Related work:

1. Section 031000: Concrete formwork.
2. Section 033000: Cast-in-place concrete.
3. Section 042200: Unit Masonry.

1.2 QUALITY ASSURANCE

A. Comply with the pertinent provisions of the latest edition of the following, except as may be modified herein.

1. ACI 318 "Building Code Requirements for Reinforced Concrete", hereinafter called "ACI 318".
2. ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures", hereinafter called "ACI 315".
3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

B. Inspections: Drawings and general provisions of the Contract Documents including General, Supplemental and other Conditions and Division 1.

C. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.

1.3 SUBMITTALS

A. SHOP DRAWINGS

1. The Contractor shall submit to the Architect, for review, complete and reviewed, reinforcing steel bending and placing diagrams prepared by or under the supervision of a qualified steel detailer; prepare in accordance with ACI 315.
2. Shop drawings shall show details, dimensions and schedules for the fabrication and placing of reinforcing and accessories. Fabrication of items shown in shop drawings shall not begin until Architect has completed his review.
3. Include materials list of items proposed to be provided under this Section, together with manufacturer's specifications and other data needed to prove compliance with specified requirements.
4. Shop drawings are interpretations of and are supplemental to the design drawings and specifications. Their intent is to demonstrate to the Architect that this Contractor has understood the design concept, and to provide the detailed information necessary for the

fabrication, assembly and installation of the products or materials specified. Neither the shop drawings nor comments placed on them by the Architect shall be construed as being change orders.

PART 2 - PRODUCTS

2.1 MATERIALS

A. BAR REINFORCING STEEL

1. Unless otherwise specifically noted in Structural Notes, furnish deformed bars meeting requirements set forth in ASTM A615 minimum, Grade 60. Bars shall be unpainted, uncoated, and free from rust, dirt and loose scale.
2. Where reinforcing requires welded connections, furnish weldable reinforcing bars which meet the chemical requirements of ASTM A706 (Grade 60 ksi) with a minimum carbon equivalent of .55 percent.

B. WELDED STEEL WIRE FABRIC

1. Furnish welded wire fabric meeting requirements set forth in ASTM A185 and A82, Fy=65 ksi.

C. FIBROUS SECONDARY REINFORCEMENT

1. General:
   a. Use in all standard weight concrete mixes for interior and exterior slabs on grade.
   b. Acceptable fibrous secondary reinforcement for slabs shall be polypropylene fiber which is inert to alkali and chemical attack; fiberglass fibers are not acceptable.
2. Length:
   a. As recommended by fibrous reinforcing manufacturer; ranging between ½" to ¾".
3. Acceptable Products/Manufacturers:
   a. "Nycon" as manufactured by Nycon Inc.
   b. "Fibermesh" as manufactured by Fibermesh Co.
   c. "Microfiber" as manufactured by W. R. Grace.

D. ACCESSORIES

1. General:
   a. Use wire bar type supports complying with CRSI recommendations, unless otherwise shown on Drawings. Do not use wood, brick, or other non-complying material.
   b. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
   c. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized, plastic-protected legs, or stainless steel. In addition, portions of all accessories within ¾" of the concrete surface for painted or unpainted exposed concrete surfaces shall be stainless steel and bars shall be tied with stainless steel wire, whether for exterior or interior exposure.
2. Tie Wire:
   a. 16 gauge or heavier, double annealed wire.
3. Spacer Bars for Wall Reinforcing:

a. No. 3 bars, “U” shaped. Stock items of equivalent function may be submitted for approval.

4. Mortar Blocks:
   a. Furnish as required for use as spacers in placing reinforcement; shall be 2” square (maximum).
   b. Mortar blocks shall be constructed of mortar mixed with the same proportions of sand and cement used in concrete, and develop a minimum compressive strength of 4,000 psi at 28 days.
   c. Mortar blocks shall have a tie wire embedded and the protruding ends to be tied to the reinforcing steel to hold the mortar blocks in place; mortar blocks with a grooved top may be used for supporting steel in slabs.
   d. Do not use wood, brick, or other non-complying material.
5. Metal Chair Supports:
   a. In lieu of mortar blocks, furnish approved heavy-duty plastic-type chair supports, sized to support all slab steel to proper height and with cushioned pads to prevent vapor barrier membrane penetration.

2.2 FABRICATION

A. General:

1. Fabricate reinforcing bars to conform to the required shapes and dimensions, with fabrication tolerances complying with the CRSI Manual.
2. In case of fabricating errors, do not straighten or rebend reinforcement in a manner that will weaken or injure the material.
3. Reinforcement with any of the following defects will not be acceptable.
   a. Bar lengths, depths, and/or bends exceeding the specified fabrication tolerances;
   b. Bends or kinks not shown on the Drawings;
   c. Bars with reduced cross-section due to excessive rusting or other cause.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Hooks & Bends:

1. Minimum Bend Diameter: The diameter of bend measured on the inside of the bar for standard hooks, other than stirrup and tie hooks, not less than:

Bar Size	Minimum Diameter
#3 through #8	6 bar diameters
#9 through #11	8 bar diameters

2. Field bending of reinforcing bars, unless specifically noted on the Plans, will not be allowed. If bars are found to be field bent, especially brittle grade 60 bars, the Contractor will be responsible to provide corrective measures as directed by the Architect.

B. Cleaning Reinforcement:

1. Clean reinforcement, at time concrete is placed, free of mud, oil, or other materials that will reduce the bond. Conform to ACI 318.

C. Placing & Fastening Reinforcement:

1. General:
   a. Prevent water from softening soil under reinforcing during steel placing.
   c. Conform to ACI 318 for placing, supports, tolerances, and draped fabric, unless noted otherwise on Drawings.
2. Placement:
   a. Place reinforcement as shown on Drawings.
   b. Accurately position in accordance with shop drawings; support and tie intersections in accordance with best practices and as necessary to secure reinforcement and prevent displacement by formwork, construction, or concrete placement operations.
   c. Locate and support reinforcing by metal chairs or mortar blocks as required; wood or foam supports are not acceptable.
   d. Reinforcing bars may be relocated as necessary to avoid interference with other reinforcement, conduit, or other embedded items.
   e. If any reinforcing bar is moved a distance exceeding one bar diameter of the specified placing tolerance, the resulting rearrangement of the reinforcement shall be subject to acceptance by the Structural Engineer.
   f. Reinforcement to maintain minimum concrete coverage as shown.
3. Fastening:
   a. Securely tie bars and bar supports together with 16 gauge wire to hold reinforcement accurately in position during concrete placement.
   b. Set wire so that ends are directed into the concrete.
   c. Wire tie stirrups and ties to main reinforcement.
4. Supports:
   a. General: Provide sufficient number of supports and of strength to carry the reinforcement. Do not place reinforcing bars more than 2 inches beyond last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
   b. On ground: Use concrete block.
   c. Over Formwork: In unexposed areas use concrete block or metal chairs. In exposed slabs and similar conditions use approved “invisible” metal chairs, hot-dip galvanized or approved plastic type.

D. SPACING OF BARS

1. Space reinforcing bars to comply with ACI 318 unless otherwise noted on Drawings. In conformance with placement requirements specified above, reinforcing bars may be relocated as necessary to avoid interference with other reinforcement, conduit, or other embedded items.

E. SPLICES IN REINFORCEMENT

1. CRSI standard by lapping ends, placing bars in contact, and tightly wire tying or by welding in an approved manner, except as noted otherwise. Do not splice bars except at locations shown on Drawings, except as otherwise specifically approved by Structural Engineer.

2. All welding to conform to “Recommended Practice for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete” of the American Welding Society (AWS D 12.1), performed in accordance with AWS D1.4.
3. All reinforcing bars requiring hooks: The minimum “Standard Hook” and leg extension, except as otherwise noted.
4. Splice in a manner developing at least 125% of the yielding strength of the bar.

F. SHRINKAGE & TEMPERATURE REINFORCEMENT

1. Conform to ACI 315 for reinforcement for shrinkage and temperature stresses normal to principal reinforcement where same is placed in one direction only.

G. CONCRETE PROTECTION FOR REINFORCEMENT

1. Conform to Structural Drawings and ACI 318.

H. STEEL DOWELS

1. Provide dowel bars where shown or required for connecting to in-place or subsequent work as shown.

I. PLACING WELDED WIRE FABRIC

1. Install in all concrete slabs on grade, except slabs where bar reinforcing is indicated; provide sizes specified herein or otherwise indicated, and with minimum coverages indicated for concrete protection.
2. Install welded wire fabric in as long lengths as practicable.
3. Lap adjoining pieces at least 12” or one full mesh spacing plus 2”, whichever is greater, and lace splices with 16 gauge wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
4. Do not carry through expansion joints.

J. FIBROUS SECONDARY REINFORCEMENT

1. For all standard weight slabs on grade add fibrous reinforcing to concrete mix at the batch plant, at manufacturer’s recommended rate per cubic yard of standard weight and lightweight concrete mixes, and in strict accordance with fiber manufacturer’s printed instructions.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. WORK INCLUDED: Drawings and general provisions of the Contract Documents including General, Supplementary and other Conditions and Division 1, “General Requirements” Sections, apply to the work specified in this Section.

B. RELATED WORK

1. Section 031000: Concrete formwork.
2. Section 032000: Concrete reinforcement.
3. Section 033450: Concrete finishing.

C. COORDINATION

1. Coordinate all installation under this Section with work of other trades.

1.2 QUALITY ASSURANCE

A. GENERAL

1. Concrete shall conform to all provisions of the latest edition of the (ASTM) American Society for Testing and Materials and the (ACI) American Concrete Institute noted within this specification, except as modified by the Supplemental Requirements contained herein.
2. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
3. Preinstallation (or Preconstruction) Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Management and Coordination”.

B. STANDARD SPECIFICATIONS

1. Conform to ACI Specifications for Structural Concrete for Buildings (ACI 301) hereinafter called “ACI 301”.
2. Conform to ACI 302 “Guide for Concrete Floor and Slab Construction”.
3. Conform to ACI 304 “Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete”.
4. Conform to ACI 306R “Recommended Practice for Cold Weather Concreting”; conform to ACI 305R “Recommended Practice for Hot Weather Concreting”.
5. Conform to ACI 308 “Standard Practice for Curing Concrete”.
6. Conform to ACI 318 “Building Code Requirements for Reinforced Concrete”.
7. Unless otherwise shown or specified, design, construct, erect, maintain, and remove forms and related structures for cast-in-place concrete work in compliance with the American Concrete Institute Standard ACI 347, “Recommended Practice for Concrete Formwork”.
8. Conform to ASTM C979 “Pigments for Integrally Colored Concrete”.

C. QUALITY CONTROL

1. Do not commence placement of concrete until mix designs have been reviewed and approved by the Architect and all governmental agencies having jurisdiction, and until copies are at the job site, and the batch plant. Also, no concrete shall be placed until the Contractor has secured the Architect's approval of the completed reinforcement placement.
2. See drawings and general provisions of the Contract Documents including General, Supplementary, and other Conditions and Division 1. Also see other requirements for testing as stated in Part 3 of this Section; conform to requirements, therefore, and furnish materials for tests. Give inspector full cooperation.

D. NOTICE OF INTENTION TO PLACE CONCRETE

1. Notify Architect, Structural Engineer, and Special Inspector at least 48 hours prior to an intended pour.

1.3 SUBMITTALS

A. SUBMIT

1. Submit list of all items proposed to be provided under this Section together with manufacturer’s product data and installation instructions for all such proprietary materials.
2. Submit product data and manufacturer’s instructions for all required products.

B. Provide the following submittals in accordance with ACI-301:

1. Admixture certification. Chloride ion content must be included.
2. Aggregate certification.
3. Concrete mix design. Submit a mix design for each strength and type of concrete. Clearly indicate where each mix design will be used.
4. Construction and control joints not shown on drawings.
5. Materials and methods for curing (per Section 033450).
6. Laboratory tests on concrete.

C. Furnish sample slabs as directed by the Architect for the various slab finishes such as stained and exposed aggregate finishes, if and where shown on the Architectural Drawings.

D. As required, submit sample chip(s) of specified color(s) indicating color additive number(s) and required dosage rate(s). Samples indicate general color and may vary from concrete finished in field according to Specifications.

1.4 JOB CONDITIONS

A. WINTER CONCRETING

1. Provide adequate equipment for heating materials and protecting concrete during freezing or near-freezing weather.
2. Keep all materials, reinforcement, forms, and ground in contact with concrete, free from frost; use no materials containing ice.

B. HOT WEATHER CONCRETING

1. Take steps to reduce concrete temperature and water evaporation by proper attention to ingredients, production methods, handling, placing, protecting and curing.

C. LOADING STRUCTURES

1. Protect all in-place structures from excessive loading. Shore and brace as necessary to prevent all damage.

D. FIELD REFERENCE MANUAL

1. A copy of ACI SP-15 “Field Reference Manual” which includes ACI 301 shall be kept in the Contractor’s Field Office at all times.

1.5 DELIVERY, STORAGE AND HANDLING

A. Color Additives, Where Required: Comply with manufacturer’s instructions. Deliver color additives to job site or batch plant in original, unopened packaging. Store in dry conditions.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Provide in accordance with Section 031000 for all work of this Section.

2.2 CONCRETE MATERIALS

A. PORTLAND CEMENT

1. Provide a standard brand of Portland cement complying with ASTM C150, Type II, low alkali. Do not change the brand of cement during progress of the Work except as approved in writing by the Architect.

B. AGGREGATE

1. General
   a. Provide hardrock aggregate complying with ASTM C33, with additional attributes specified herein.
   b. For making grading tests of fine and coarse aggregate, use square mesh wire cloth complying with ASTM E11.
2. Fine aggregate
   a. Provide washed natural sand having strong, hard, durable particles, and containing not more than 2% by weight of deleterious matter such as clay lumps, mica, shale, or schist.

b. Grade from coarse to fine within the following limits:

Sieve size:	Percentage by weight passing sieve: Minimum:	Maximum:
3/8”	100	---
No. 4	95	100
No. 8	65	95
No. 16	45	75
No. 30	30	50
No. 50	10	22
No. 100	2	8

3. Coarse aggregate
   a. Provide coarse aggregate consisting of clean, hard, fine grained, sound crushed rock or washed gravel, or a combination of both, containing not more than 5% by weight of flat, chip-like, thin, elongated, friable, or laminated pieces, nor more than 2% by weight of shale or cherty material. Any piece having a length in excess of five times the average thickness shall be considered flat or elongated.
   b. Use coarse aggregate of the largest practicable size for each condition of placement, subject to the following maximum size limitations: Do not exceed 3/4 of the clear distance between reinforcing bars 1/5 of the narrowest dimension between sides of forms, or 1/3 the depth of any slab section.
   c. Grade combined aggregates within the following limits:

Sieve size or size in inches	Percentage by weight passing sieve: 1-1/2” aggregate: Min:	Max:	1” aggregate: Min:	Max:	3/4” aggregate: Min:	Max:
1-1/2”	95	---	---	---	---	---
1”	75	90	90	100	---	---
3/4”	55	77	70	90	90	100
3/8”	40	55	45	65	60	80
No. 4	30	45	31	47	40	60
No. 8	22	35	23	40	30	45
No. 16	16	30	17	35	20	35
No. 30	10	20	10	23	13	23
No. 50	2	8	2	10	5	15
No. 100	0	3	0	3	0	5

C. WATER

1. Use only water which is clean and free from deleterious amounts of acid, alkali, salt, and organic materials.

2.3 ADMIXTURES

A. Use only standard brands of admixtures for concrete, approved by the Architect, meeting or exceeding the following requirements.

1. Air entraining admixtures shall conform to "Specifications for air-entraining admixtures for Concrete" ASTM C-260.
2. Water Reducing Admixture: "Eucon WR-75" by The Euclid Chemical Co., "Pozzolith 200N" by Master Builders, "Plastocrete 161" by Sika Corporation, and WRDA-64 by

W.R. Grace. The admixture shall conform to ASTM C-494, Type A and not contain more chloride ions than are present in municipal drinking water.

3. Water Reducing, Retarding Admixture: "Eucon Retarder-75" by The Euclid Chemical Co., "Pozzolith 100XR" by Master Builders, DARATARD-17 by W.R. Grace, or "Plastocrete 161MR" by Sika Corporation. The admixture shall conform to ASTM C-494, Type D and not contain more chloride ions than are present in municipal drinking water.
4 Mid-Range Water Reducing Admixture: "Daracem-55" as manufactured by W.R. Grace, Sikament HP" as manufactured by Sika Corporation, or approved equal. The admixture shall not contain calcium chloride, and shall conform to ASTM C-494, Type A.
5. High Range Water Reducing/Retarding Admixture (Superplasticizer): "ECON 537" by The Euclid Chemical Co., DARACEM 100 by W.R. Grace, or "Sikament 320" by Sika Corporation. Admixture shall conform to ASTM C-494, Type G, and not contain more chloride ions than are present in municipal drinking water.
6. High Range Water Reducing Admixture (Superplasticizer): "Eucon 37" by The Euclid Chemical Co., WRDA-19 by W.R. Grace, or "Sikament 86" by Sika Corporation. The admixture shall conform to ASTM C-494, Type F, and not contain more chloride ions than are present in municipal drinking water.
7. Non-Corrosive, Non-Chloride Accelerator: "Accelguard 80" by The Euclid Chemical Co., DARASET by W.R. Grace, "Plastocrete 161FL" by Sika Corporation, or approved equal. The admixture shall conform to ASTM C-494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.
8. Concrete Corrosion Inhibitor: DCI Corrosion Inhibitor by W.R. Grace & Co., "Armatec 2000" by Sika Corporation or approved equal. The admixture shall conform to ASTM C-494 Type C. When this is specifically noted to be used, it shall be used at a dosage rate of 2 gallons per cubic yard (Armatec 2000 by Sika Corporation at 1/2 gallon per cubic yard).
9. Prohibited Admixtures: Calcium chloride, thiocyantates or admixtures containing more than 0.05% ions by weight of cement are not permitted.
10. Certification: Written conformance to the above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Architect.

2.4 ACCESSORY MATERIALS

A. Expansion joint filler: Provide preformed strips, non-extruding and resilient bituminous type, of thickness indicated, complying with ASTM D1751, ("Fibre Expansion Joint" by W.R. Meadows or approved equal).

B. Bonding Materials: The compound shall be a polyvinyl acetate, rewettable type, "Euco Weld" by The Euclid Chemical Company or "Weld-crete" by The Larsen Company. Use only in areas not subject to moisture.

C. Bonding Admixture: The compound shall be a latex, non-wettable type, "SBR Latex" or "Flex- Con" by The Euclid Chemical Company, or "Daraweld C" by W.R. Grace.

D. Structural Bonding Epoxy Adhesive: The compound shall meet ASTM C-881 and shall be a two (2) component, 100% solids, 100% reactive compound suitable for use on dry or damp surfaces, "Euco Epoxy #452 MV or #620" by The Euclid Chemical Company, "Sikadur Hi-Mod or Sikadur 32 Hi-Mod LPL" by Sika Chemical Corporation.

E. Patching Mortar: "Verticoat" by The Euclid Chemical Co. or "Sika Repair 223" by Sika Chemical Corporation. The compound shall be epoxy type, 100% solids, suitable for use on dry or damp surfaces.

F. Patching Compound: Free-flowing, polymer-modified cementitious repair mortar, "Euco Thin Top Supreme" by The Euclid Chemical Co., "SikaTop 121" or "SikaTop 122" by Sika Corporation.

G. Epoxy Joint Filler: Shall be a multi component, 100% solids compound with a minimum shore D hardness of 50, "Euco Epoxy #700" by The Euclid Chemical Company or "Sikadur 51 NS/SL" by Sika Chemical Corporation. When and where this is specifically noted to be used, this shall be applied as late as possible after the concrete floor slab is poured, preferably at least 6 months, but not earlier than 2 months after the concrete floor slab is poured. Use in all interior slab joint locations, where concrete slab is to be left exposed.

H. Non-shrink Grout: The grout shall conform to CRD C-621-83, "Corps of Engineers Specification for Non-shrink Grout". The grout shall be “Hi-Mod” (non-catalyzed metallic) or "Euco N-S" (non- metallic) by the Euclid Chemical Company, or “Embeco 636” (non-catalyzed metallic), "Masterflow 713" (non-metallic) by Master Builders, or “Sealtight 588 Grout”, by W.R. Meadows.

I. Evaporation Retarder: The compound shall be "SikaFilm" by Sika Corporation, "Confilm" by Master Builders, or “Eucobar” by Euclid Chemical Company.

J. Joint Sealant: Shall be "Eucolastic 1SL" by The Euclid Chemical Company, or "SikaFlex la" by Sika Corporation. The sealant shall be a one part urethane sealant requiring no primer and conforming to ASTM C-920, Type S, grade NS., class 25. Use in exterior slab joint locations, where specifically noted.

K. Concrete Fibers: Concrete fibers for all designated areas shall be 100% virgin polypropylene material. Fibers shall be 1/2" or 3/4" in length such as Grace "Microfiber" by W.R. Grace, "Fibermesh" by Fibermesh Co., or approved equal. Fibers shall be used at a minimum dosage rate of 1-1/2 lbs. per cubic yard, unless otherwise specified. Grace "Microfiber" shall be used at a rate of 1 lb. per cubic yard.

2.5 EQUIPMENT FOR MIXING & PLACING

A. CONVEYING EQUIPMENT

1. Use crane bucket, wheelbarrow, pumps, or buggies to deliver concrete to placing location.
2. Chuting permitted only by methods to insure a practically continuous flow of concrete at delivery and to prevent material separation.
3. If pumping is employed, secure prior approval of equipment, procedures and mix design. No aluminum pipes or chutes will be permitted for pumping, chuting or tremie operations.

B. COMPACTION EQUIPMENT

1. Use internal mechanical vibrators with 7000 rpm minimum frequency.

2.6 CONCRETE MIXES

A. Provide a mix design prepared by the approved testing agency, based on strengths of the approved materials, and meeting the requirements stated on the Drawings.

B. Proportions for concrete mixes shall be in accordance with ACI 301. All mixes must be approved by the Architect prior to use on the job. No deviations from the approved mixes will be permitted without written prior approval of the Architect.

C. Where the concrete production facility can establish the uniformity of its production for concrete of similar strength and materials based on recent test data, the average strength used as a basis for determining mix design proportions shall exceed the specified design strength by the requirements of ACI-318 or ACI-301.

D. When a concrete production facility does not have field test records for calculation of standard deviation, the required average strength shall be at least 1200 psi greater than the specified design strength.

E. Secure the Architect's approval of each mix design, including new mix designs required to be prepared should there occur a change in materials being used.

F. All concrete shall contain the specified water-reducing or water-reducing retarding admixture and/or mid-range or high-range water-reducing admixture (superplasticizer). All concrete slabs, placed at air temperatures below 40° F shall contain the specified non- corrosive non-chloride accelerator. All concrete required to be air entrained shall contain an approved air-entraining admixture. All pumped concrete, concrete for industrial slabs, architectural concrete, concrete required to be watertight, and concrete with a water- cement ratio below 0.50 shall contain the specified high-range water-reducing admixture (superplasticizer). All concrete slabs and flatwork, both interior and exterior, shall contain the specified concrete fibers.

G. All concrete containing the high-range water-reducing admixture (superplasticizer) shall have a maximum slump of 8" unless otherwise approved by the Architect. The concrete shall arrive at the job site at a 3" max. slump, be verified, then the high-range water-reducing admixture added to increase the slump to the approved level. All other concrete shall have a maximum slump of 3" for slabs and 4" for other members. This maximum slump may not be exceeded except by the job-site addition of the specified high-range water-reducing admixture, (Superplasticizer). In those portions of the structures where member dimensions and/or congestion due to reinforcing steel prevent the proper placement and consolidation of the concrete at the maximum slump specified, superplasticizer shall be used by the Contractor in lieu of increasing the slump of non- superplasticized concrete by the addition of water.

H. Hardrock concrete

1. Achieve a weight of approximately 145 pcf and an ultimate compressive strength as listed in the following table.

Concrete Types

Location	Req'd 28 day Compressive Strength	Maximum Water Cement Ratio	Air Content
Footings, and all other below grade	3000	0.50	Optional
Interior slabs on grade, and interior walls	3500	0.50	2% ± 1%

Concrete subjected to freezing and thawing and exterior slabs subjected to deicers	4000	0.45	6% ± 1%

I. Do not retemper mix by adding water in field.

PART 3 - EXECUTION

3.1 PREPARATION

A. SURFACE CONDITIONS

1. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. CLEANING FORMS

1. Before placing concrete, clean spaces within forms of all refuse, debris and dirt. Provide cleaning holes for removal of foreign matter; after cleaning, replace forms at openings and brace to prevent form failure.

C. MIXING & PLACING

1. Conform to the requirements of ACI 301.
2. Clean free of all foreign matter and ice, all mixing and transporting equipment, subgrade and forms to receive concrete.
3. Clean reinforcement of deleterious coatings and ice.

D. EMBEDMENT FOR GENERAL WORK IN OTHER SECTIONS

1. Allow other trades time and facilities to install necessary embedded items such as nailers, hangers, inserts and sleeves; and other items as noted herein.

E. EMBEDMENT FOR MECHANICAL & ELECTRICAL WORK

1. Cooperate with and allow time for and access to forms for embedment of pipes and conduits. Conduits, pipes and other utilities shall **not** be placed in slabs on grade.
2. Place sleeves and core forms as required or mechanical and electrical work, sizes and locations as shown as directed by cognizant trades.

3.2 INSTALLATION OF FORMWORK

A. In accordance with Section 031000.

3.3 CONCRETE MIXING

A. Concrete for minor work, when approved by the Architect, may be mixed at the site in a power mixer when the mixer has a capacity not less than one full sack batch.

B. Unless otherwise approved by the Architect, use ready mixed concrete complying with ASTM C94.

1. Mixing
   a. Mix each batch of concrete not less than 15 minutes, five minutes of which shall be at the site.
   b. Rotate the drum at the rate specified by the manufacturer of the mixer as "mixing speed."
   c. Whenever there is a delay in unloading, rotate the drum slowly at intervals to prevent incipient set of concrete.
2. Addition of water:
   a. Normally, do not deliver concrete with total permissible amount of water incorporated therein.
   b. After water is added, at least five minutes of mixing time shall be immediately prior to discharge.
   c. Concrete will be rejected if not placed in final position within 1-1/2 hours after water is first added to the batch.
3. Concrete at time of placing shall be in such condition that it can be placed properly.
4. Discharge all wash water from the mixing drum before the truck reloads at the batching plant.
5. Mixing equipment shall not be charged beyond its rated capacity.

C. Concrete consistency

1. Use the amount of water established by the approved mix design.
   a. Do not exceed the maximum quantity specified for the grade of concrete.
   b. Use the minimum amount of water necessary to produce concrete of the workability required by the Architect.
   c. Do not supplement the predetermined amount of water with additional water for any reason.
2. Measure concrete consistency by ASTM C143 method.
3. Provide maximum slumps of concrete as follows:
   a. Footings and slabs on soil: 3", (+1", -1").
   b. Other concrete: 4".

D. Cement grout and dry-pack grout

1. Mix at the site, in composition of one volume of portland cement to 2-1/2 volumes of fine aggregate.
2. Mix the materials dry; then add sufficient water to make the mixture flow under its own weight.
3. When grout is used as dry-pack concrete, add sufficient water to make a stiff mixture which can be molded into a sphere.

E. Miscellaneous provisions

1. Provide strengths of concrete as shown on the Drawings and the table herein.
2. Provide concrete dense and free from honeycomb and other defects.
3. Place and finish members to conform to the shapes and dimensions indicated, with all surfaces true to line, plumb, and level.

3.4 INSERTS, ANCHORS, AND EMBEDDED ITEMS

A. Concrete fasteners

1. In addition to their use where the pins are loaded in shear, powder driven concrete fasteners may be used in tension for support of light loads such as acoustical ceilings, duct work, conduits, pipes, and similar items when such loads are limited to less than 75 lbs.
2. Where "Red Head", "Hilti", or similar types of concrete anchor bolts are used for significant gravity loads or seismic anchorage, test in the presence of the approved testing agency:
   a. Proof test 50% of the bolts (alternate bolts in any group arrangement) to twice the allowable load.
   b. If there are any failures, also test the immediately adjacent bolt.
3. Where hanger rods, bolts, wire, or similar items are used to suspend construction items, place in the concrete as required and/or indicated.

B. Reglets, Reveals, and Rebates

1. Form reglets, reveals and rebates as required to receive frames, flashing, and other equipment, and as shown on the Drawings.
2. Verify the dimensions and positions of required reglets, reveals, and rebates with the Architect and with trades whose work is related to or contingent upon such dimensions and positions.

C. Embedded Piping, and Rough Hardware

1. Coordinate the various trades who are required to fasten work to the structure, or are required to insert therein any sleeve, box, bolt, anchor, insert, or other rough hardware.
2. Provide every facility for setting all required items accurately in the forms.
3. Be responsible for changes in position of such items after they have been set.
4. Provide in the forms for all sleeves, boxes, bolts, anchors, inserts, strap anchors, for frames, and other rough hardware required for the Work, and which are shown or required to be embedded in the concrete.
5. Conduits and sleeves
   a. Locate so as not to reduce the strength of construction. Do not place pipes or conduits in slabs.

3.5 CONVEYING AND PLACING CONCRETE

A. Before placing concrete, thoroughly clean forms, wash out with water, and make tight.

B. Time of placing

1. Do not place concrete until reinforcement, conduits, outlet boxes, anchors, sleeves, hangers, bolts, and other embedded materials are securely and properly fastened in their correct positions.
2. Secure the Architect's approval of reinforcement before commencing placement of concrete.

C. Preparation

1. Before new concrete is deposited upon or against concrete that has taken its initial set or has hardened, remove all incrustations from forms and reinforcement.
2. Remove all laitance, oil, and loose particles from concrete and concrete surfaces, and thoroughly clean the forms with water under stiff pressure.
3. Remove all laitance after concrete has hardened partially (not less than two hours nor more than four hours after placing) by brushing with stiff bristles, or by directing a stream of water from a 1/4" nozzle, or by other methods approved by the Architect, to expose the clean top surface of the coarse aggregate.
4. Where cleaning is not satisfactory to the Architect, sandblast the surface and then wash again.

D. Method of placing

1. Place concrete only under the degree of inspection described elsewhere in these Specifications, and as required by governmental agencies having jurisdiction.
2. Do not place concrete outside of regular working hours unless required inspection authorities have been notified properly and are present.
3. Spouts, pipes, troughs, belts, chain buckets, and other equipment may be used in conveying concrete, but the manner and method used shall be only as approved by the Architect.
4. Do not permit concrete to free drop more than 4'-0".
5. Deposit concrete direct into conveyances, and direct from conveyances to final points of repose, except where troughs, buckets, or the like are used, in which case dump concrete into hoppers and then into the conveyances.
6. Where tremies are used, or where the free drop is 4'-0" or more, and through reinforcement, use a dumping box or board, moving the concrete from there by shovels or hoes.
7. Deposit concrete so that the surface is kept level throughout, a minimum being permitted to flow from one position to another, and place as rapidly as practicable after mixing.
8. Do not use in this Work any concrete not placed within 30 minutes after leaving the mixer.

E. Tamping and conveying

1. Thoroughly work concrete around reinforcement and embedded fixtures, and into corners of forms, during placing operations.
2. Completely compact and vibrate all concrete including floor slabs with tamping poles, mechanical vibrators and by tapping forms until the concrete is thoroughly compact and without voids. Determine the number of tampers and vibrators needed by the amount and method of placing concrete.
3. Exercise care to tamp and vibrate concrete vigorously and thoroughly to obtain maximum density.
4. Use manual tampers as well as mechanical vibrators.
5. Exercise care to direct the quick handling of vibrators from one position to another.
6. Do not over-vibrate concrete.
7. Do not move concrete by use of vibrator.
8. Have at least one spare vibrator on site during all concrete pours.

F. Stoppages

1. Stop concrete placing only when and where approved by the Architect.

2. Maintain flow surfaces of freshly placed concrete as level whenever a pour is stopped, providing tight dams to accomplish this.
3. Make horizontal construction joints only where shown on the Drawings or specifically approved by the Architect.
4. Provide keys and dowels at construction joints where indicated on the Drawings, and where concrete placement is interrupted.

3.6 STEPS, SLABS, WALK, AND PAVING ON EARTH

A. Preparation for slabs on earth

1. Prepare the subgrade and base as specified in other Sections.
2. Dampen the subgrade for exterior slabs and paving if necessary prior to placing concrete.

B. Placing and finishing

1. Mechanically vibrate and then tamp the freshly placed concrete, using a heavy tamper, until at least 3/8" of mortar is brought to the surface.
2. Use tampers having a face consisting essentially of a grid of parallel metal bars.
3. Tamp with a light tamper, and screed with heavy straightedge, until depressions and irregularities are worked out and the surfaces are true to finish grades and elevations.
4. Remove excess water and debris worked to the surface in compaction and screeding.
5. Remove laitance as described previously.
6. When concrete has hardened sufficiently, float to a compact and smooth surface.

C. In Slabs-On-Grade Provide

1. Contraction (control) joints in interior work.
   a. By use of tooled control joints or at Contractor's option by sawcutting to 1/5 slab depth.

   b. Where not otherwise shown on Drawings, provide control joints at column centerlines and/or at the following maximum spacing:

      4" slab max. spacing = 10 ft. each way.
      5" slab max. spacing = 10 ft. each way.
      6" slab max. spacing = 12 ft. each way.
      7" slab max. spacing = 14 ft. each way.
      8" slab max. spacing = 14 ft. each way.

   c. Provide close coordination with the Architectural joint layout, pattern and spacing for all exposed to view floor slabs. This layout shall be verified prior to pouring concrete.
2. Joints in Exterior Work
   a. Provide contraction joints in exterior work where shown by means of 1" deep tooled joints with edges rounded and tool marks removed. If the layout of the contraction joints is not shown on the plans, then the Contractor shall submit a proposed layout to the Architect for approval with joints at a maximum of 5’-0” o.c.
3. At all construction joints of slabs on grade, discontinue slab reinforcement, and provide smooth, greased dowels.

4. Provide isolation joints where shown at contacts between slabs and vertical surfaces. Form with 15# felt paper for interior work and expansion joint filler for exterior work.
5. Seal exterior expansion and contraction joints where shown with the here-in specified joint sealing compound.
6. Provide the finish surfaces shown on the Drawings or otherwise directed by the Architect, in accordance with pertinent provisions of Section 033450 of these Specifications.

D. Cure and protect concrete in accordance with pertinent provisions of Section 033450 of these Specifications, and ACI 302.

3.7 SODA AND ACID WASH

A. At concrete surfaces to receive plaster, paint, or other finish, and which have been formed by oil- coated forms, scrub with a solution of 1-1/2 lbs caustic soda to one gal. of water.

B. On surfaces where smooth wood or waste molds have been used, scrub with a solution of 20% muriatic acid or hydro-chloric acid.

C. After the surfaces have been scrubbed, wash with clean water as soon as possible.

3.8 DEFECTIVE CONCRETE

A. The following concrete will be deemed to be defective, and shall be removed promptly from the job site.

1. Concrete which is not formed as indicated, is not true to intended alignment, is not plumb or level where so intended, is not true to intended grades and levels.
2. Has voids or honeycombs that have been cut, resurfaced, or filled, unless with the approval of the Architect.
3. Has sawdust, shavings, wood, or embedded debris.
4 Does not have the specified finish, or reveals.
5. Has cracking which is more than minor hairline cracks, and which are unacceptable to the Architect.
6. Or does not conform fully to the provisions of the Contract Documents.

B. Repairs and Replacements

1. Defective concrete may be cut out and repaired with gunite, or other approved methods, when and as directed by the Architect.
2. Where defective concrete is found after removal of the forms, cut out the defective concrete, if necessary, and make the surfaces match adjacent surfaces.
3. Repair of Surface Defects. All voids, damaged places, fins, projections, honeycomb areas, and tierod holes shall be removed down to sound concrete and shall be repaired immediately after form removal and after a concrete curing compound is applied. The specified bonding agent shall be used for all patching and the specified epoxy adhesive and/or epoxy mortar shall be used for all structural repairs. All patching and repairs shall have prior approval of the Architect as to method and procedure. Any concrete which has not been formed as shown on the contract drawings, is out of alignment or level or indicated a defective surface or unsoundness of any nature shall be removed and replaced to the limits required by the Architect unless he grants permission to patch or otherwise correct the defective work. Permission to patch or attempt the correction shall

not be construed to be a waive of the Architect's right to require complete removal of defective work.

4. Work uneven surfaces and angles of concrete to a surface matching adjacent concrete surfaces.

3.9 GROUTING AND CEMENT POINTING

A. All column base plates, equipment bases, and other locations noted on the structural drawings shall be grouted with the specified non-shrink grout. All exposed grout shall be the specified non- metallic type.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Walls and curbs

1. Construct header walls and curbs as shown on the Drawings.
2. Trowel exposed concrete surfaces smooth.

B. Leave openings in the floor slabs and future foundations for machines and equipment, where so indicated on the Drawings, and in dimensions and arrangements required for the approved machines and equipment.

3.11 INSPECTIONS & TESTING

A. The required testing services of Section 16.3 and 16.4 of ACI-301 shall be performed by an independent testing laboratory approved by the Architect and paid for by the Owner. The testing services required in Section 16.5 shall be performed by the same testing laboratory and paid for by the General Contractor.

B. The testing laboratory representative shall be present during the placement of all concrete unless this requirement is waived by the Architect. The testing laboratory shall conduct the tests specified in 16.3 and in addition shall inspect the reinforcing steel placement (including grade of steel) prior to the beginning of placement. The Contractor shall provide ample notice to the testing laboratory and shall make available to the testing laboratory, shop drawings of the reinforcing steel placement bearing the shop drawing review stamp of the Architect.

C. When requested the testing agency shall provide evidence of recent inspection (within the last three years) of its facilities by the Cement and Concrete Reference Laboratory of the National Bureau of Standards. Evidence shall be presented to indicate that deficiencies mentioned in the report of that inspection have been corrected.

D. Standard slump and cylinder samples (3) must be taken after addition of water. The method of measuring water and the person(s) authorized to add water and make samples must be mutually responsible for cost of additional sampling and testing costs related to discharging concrete in conflict with Contract Documents. All concrete requiring a slump change of more than 2", except when the HRWR admixture is being used, will be rejected.

E. Compression test specimen: ASTM C 31, one set of 3 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. Test one cylinder at seven days, one at 28 days, and hold the third cylinder until needed.

F. Slump and compressive strength tests: ASTM C 39 - one set for each 50 cu. yd. or fraction thereof, of each class of concrete placed in any one day or for each 5000 sq. ft. of surface area placed: one specimen tested at 7 days, one specimen tested at 28 days and one specimen retained in reserve at the laboratory for later testing if required.

G. Determine air content of normal-weight concrete for each strength test. In addition, for all exterior flat-work concrete, determine air content per ASTM C 231-82 for each 20 cu. yd. placed.

H. When concrete fails to meet the acceptance criteria specified in ACI-301, Section 17.2, the Architect may order further testing of concrete in place in accordance with Section 17.3. When such tests are ordered, cost of testing shall be paid by the Contractor.

I. The Contractor shall bear all cost of correcting rejected work, including the cost of the Architect's additional services thereby made necessary.

END OF SECTION 033000

SECTION 033450 - CONCRETE FINISHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Drawings and general provisions of the Contract Documents including General, Supplementary and other Conditions and Division 01, “General Requirements” Sections, apply to the work specified in this Section.

B. Related work:

1. Section 033000: Cast-in-place concrete.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Except as may be modified herein or otherwise directed by the Architect, comply with ACI 301, "Specifications for Structural Concrete for Buildings."

C. Preinstallation (or Preconstruction) Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Management and Coordination”.

D. STANDARD SPECIFICATIONS

1. Refer to Section 033000 for same and conform thereto as they apply to concrete curing and finishing work of this Section.

E. DEFECTIVE WORK

1. Contractor shall remove and replace at his own expense all defective work as adjudged by the Architect.

1.3 SUBMITTALS

A. Submit:

1. Submit manufacturer's product data and installation instructions for proprietary materials including curing agents, sealers, hardeners, and the like.

1.4 JOB CONDITIONS

A. Refer to Section 033000 for same and conform thereto as they apply to concrete curing and finishing work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete materials: Comply with pertinent provisions of Section 033000, except as may be modified herein.

B. Curing Compound for Curing Exterior Slabs:

1. Furnish liquid membrane-forming curing compound conforming to ASTM C309, Type I clear. Compound shall be a clear styrene acrylate type, 30% solids content minimum, and have test data from an independent testing laboratory indicating a maximum loss of 0.030 grams per sq. cm. when applied at a coverage rate of 300 sq. ft. per gallon.
2. Compound shall be “Super Rez Seal” by The Euclid Chemical Co., “Vulkem 2101” by Mameco International, Inc., “Masterkure 30” by Master Builders, or “Sealtight CS-309” by W. R. Meadows.
3. Manufacturer’s Certification required. (Sodium Silicate Compounds are prohibited.)

C. Curing and Sealing Compounds Interior Slabs

1. For Interior Slabs to be Left Exposed and Sealed: Furnish liquid membrane-forming acrylic polymer, water-based curing and sealing compound conforming to ASTM C1315, Type I, Class A, non-yellowing; W. R. Meadows “VOCOMP-25” or equivalent, compatible with sealer specified below.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISHING OF FORMED SURFACES – REPAIR OF SURFACE DEFECTS

A. General:

1. After removal of forms, give the concrete surfaces one or more of the finishes specified below where so indicated on the Drawings, or directed by the Architect.
2. Immediately after form removal, patch all tie holes and repairable defective areas.
3. Revise the finishes as needed to secure the approval of the Architect.

B. Formed Surfaces to be Concealed in the Finished Work:

1. Leave surfaces with the texture imparted by forms, except patch tie holes and defects.
2. Remove fins exceeding 1/4" in height.

C. Formed Surfaces to be Left Exposes in the Finished Work: All exposed concrete not otherwise specified and excluding wall surfaces in mechanical rooms and the like, shall be treated as follows:

1. Fin Removal:

a. Completely remove all surface fins by hand or power grinding with carborundum stone or power grinder to approved smoothness on surfaces to be left exposed.

2. Voids, Gravel Pockets and Similar:
   a. Cut out defective areas 1" deep; vertical edges.
   b. Wet cavities and adjacent area.
   c. Cement mortar to match adjacent areas, use as little water as possible.
   d. Retemper after 1 to 2 hours for shrinkage, as required.
   e. Thoroughly fill voids and finish off, match adjacent surface in exposed work.
   f. Finish with "Sacked Finish" as specified below.
   g. Keep patched and finished areas damp for 7 days.
3. Tie Holes:
   a. Clean and thoroughly dampen; fill solid with patching mortar as specified above for voids and pockets.

D. Sacked Finish

1. General:
   a. Provide sacked finish as specified below on all exposed surfaces of building walls and other dominant exposed surfaces.
2. Sacked Finish:
   a. Pre-dampen concrete while still green and apply matching color slurry of patching material specified above for minor defective areas and apply with burlap or sponge float.
   b. Remove any surplus, then rub with clean burlap; cure in approved manner.
   c. All sacked finish surfaces shall be smooth and uniform in appearance, pinhole free, with all imperfections completely concealed.

E. Wall & Curb Tops, Horizontal Offsets, Other Unformed Surfaces

1. In general, strike smooth after placing concrete, float to continued uniform surface and to texture reasonably consistent with adjacent formed surfaces, as approved.

3.3 FINISHING SLABS

A. Finishing Slabs – General

1. All floor surfaces shall be within ±1/2" of finished floor elevations designated on plans. If variations greater than this exist, the Architect may direct the Contractor to grind the surfaces to bring them within the requirements. Patching of low spots shall not be permitted. Grinding shall be done as soon as possible, preferably within 3 days, but not until the concrete is sufficiently strong to prevent dislodging coarse aggregate particles.
2. Floor Flatness/Leveling Tolerances: F_F defines the maximum floor curvature allowed over 24 in. computed on the basis of successive 12 in. (300 mm) elevation differentials, F_F is commonly referred to as the "Flatness F-Number".

$$F_F = \frac{4.57}{\text{Maximum difference in elevation, in decimals of inches, between successive 12" elevation differences.}}$$

F_L defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 ft. (3.5 m) distance. F_L is commonly referred to as the "levelness F-Number".

$$F_L = \frac{12.5}{}$$

Maximum difference in elevation, in decimals
in inches, between two points separated by 10 ft.

All floors shall be measured in accordance with ASTM E-1155 " Standard Test Method for Determining Floor Flatness and Levelness Using the "F-Number" System (Inch-Pound Units).

All float finishes shall achieve an F_F 20/F_L 17 tolerance.

Unless otherwise noted, all troweled slabs shall achieve an F_F 35 (Differences in elevation in successive 12 in. measurements shall not exceed 0.131 in.) / F_L 33 (Differences in elevation between two points shall not exceed 0.375" in 10 ft.).

3. Slab Curling: Acknowledging that there will be a strong possibility of having at least some slab curling at slab edges, the Contractor shall take reasonable means to keep this curling to a minimum. In the event that curling occurs to an extent and at locations which will be detri- mental to the service and Architectural qualities needed for the final slab finish, the Contrac- tor shall, at his expense, provide edge grinding or other means as necessary to bring the slab curling to a finish surface acceptable to the Architect.

B. Slab Finishes

1. Unless otherwise shown, scheduled or specified hereinafter, use the following finishes, as applicable:
   a. Furnish smooth, hard-troweled finish for all interior floors to remain as walking surfaces and which are scheduled in Room Finish Schedule to receive sealed finish.
   b. Furnish smooth troweled finish for all exterior equipment pads, dumpster pads, and the like.
   c. Furnish broomed trowel finish for all exterior walks, ramps, stairs and miscellaneous slab surfaces not otherwise specified to receive smooth trowel or exposed aggregate finishes.
   d. Furnish “tactile” diamond pattern finish, in addition to broom finish, at handicap ramp cur- cut slab areas indicated to receive “tactile warning surface”.
   e. Furnish “non-slip” finish for cast-in-place curbs and associated gutters, as applicable, integral with sidewalks.
2. Before finishing work begins, place, strike off, consolidate and level and/or slope, as applicable, concrete to condition ready for finishing.
3. Consolidate placed concrete preferably with power driven floats of impact type except for thin joist slabs; use wood or cork-faced hand floats for surfaces inaccessible to power floats.
4. Replace slabs with excessive shrinkage cracks and those not properly sloped and finished to floor flatness and leveling tolerances specified above, as approved, without additional cost to Owner.

C. Float Finish:

1. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further until ready for floating.
2. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.
3. During or after the first floating, check the planeness of the surface with a ten foot straightedge applied at not less than two different angles.
4. Cut down high spots and fill low spots.
5. Refloat the slab immediately to a uniform sandy texture.

D. Broomed Float Finish:

1. Provide a floated finish as described above. After floating, draw a broom across surface to a light scored texture finish, as approved.

E. Troweled Finish:

1. Provide a floated finish as described above, followed by a power troweling and then a hand troweling.
   a. Produce an initial surface which is relatively free from defects, but which still may show some trowel marks.
   b. Provide hand troweling when a ringing sound is produced as the trowel is moved over the surface.
   c. Thoroughly consolidate the surface by hand troweling.
2. Provide a finished surface essentially free from trowel marks, uniform in texture and appearance.
3. On surfaces intended to support floor coverings, use grinding or other means as necessary and remove all defects of such magnitude as would show through the floor covering.

F. Broomed Trowel Finish:

1. Power float to trueness within the specified tolerance, and provide one-pass steel troweling. After troweling, draw a broom across surface to a light transverse scored texture, as approved.

G. Exposed Aggregate Finish:

1. Allow concrete to receive exposed aggregate finish to dry free of surface water before placing finish. Do not use accelerators or retarders in concrete to receive surface retardant treatment.
2. Apply surface retardant by roller or spray, coverage 80 to 100 square feet each gallon of retardant or as otherwise recommended by retardant manufacturer's label instructions.
3. Removing Retardant Treated Mortar:
   a. Within 12 to 24 hours, hose surface with water and scrub with stiff broom or brush, to approximately 1/8" depth; actual depth as determined by approved sample panel.
   b. Continue brushing until selected aggregate is exposed, but not dislodged, and top surface of stainless steel control joints is exposed.
   c. Clean off excess and removed material, protect and cure as hereinafter specified.

H. "Tactile" Finish:

1. After floating and applying broom finish, imprint surface of handicap curb cuts with a diamond pattern texture using an expanded metal grate imprinting tool, as approved.

I. Non-Slip Finish:

1. After troweling, obtain finish by dragging a strip of clean, wet burlap across the slab and curb surfaces to produce a fine, granular, or sandy textured surface without disfiguring marks.
2. Round edges and joints in curbs with an edger having a radius of ¼".

J. Exterior Control Joint & Slab Edge Treatment:

1. Steel tool all control joints, all exposed perimeter edges, and edges of expansion joints, prior to filling with sealant, to a smooth bullnose form, using an edger having a radius of ¼", as approved.
2. Form control joints in uniform straight lines, spaced no greater than 5 feet apart. Coordinate exact locations and alignment with Architect.

3.4 CURING AND PROTECTION

A. The Contractor shall use all necessary precautions to keep cracking of all concrete work to an absolute minimum. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.

1. Maintain curing procedures used for seven (7) days at minimum temperature of 50° F; if mean daily temperature drops below 40° F during this period, extend curing period an equal number of days or provide temporary heat or additional protection to maintain specified minimum temperature of air in contact with concrete.

B. Temperature, wind, and humidity;

1. When concrete slab placements are subjected to high temperatures, wind and/or low humidity the Architect may require the use of the specified evaporation retarder to minimize plastic cracking. The compound may be required to be applied one or more times during the finishing operation. The initial application is usually made after the strike-off operation.
2. Cold weather:
   a. When the mean daily temperature outdoors is less than 40°F, maintain the temperature of the concrete between 50°F and 70°F for the required curing period.
   b. When necessary, provide a proper and adequate heating system capable of maintaining the required heat without injury due to concentration of heat.
   c. Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.
   d. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   e. Only the specified non-corrosive non-chloride accelerator shall be used. Calcium chloride, thiocyanates or admixtures containing more than 0.05% chloride ions are not permitted.
3. Hot weather:
   a. When necessary, provide wind breaks, fog spraying, shading, sprinkling, ponding, or wet covering with a light colored material, applying as quickly as concrete hardening and finishing operations will allow.
4. Rate of temperature change:
   a. Keep the temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and not exceeding a change of 5° F in any one hour period, or 50° F in any 24 hour period.

C. Curing Walls & Formed Surfaces:

1. Where forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.
2. In hot weather, immediately after forms have been removed, cure by continuous sprinkling or covering with absorptive mat or fabric kept continuously wet or use vapor mist bath.
3. In freezing weather, protect in accordance with ACI 301.

D. Curing Exterior Slabs:

1. Spray slabs with liquid membrane-forming compound specified above for exterior slabs, applied at not less than the manufacturer's specified and recommended rate.

E. Curing and Sealing Interior Slabs:

1. For Slabs to be Left Exposed and Sealed:
   a. Spray new slab surfaces with liquid membrane-forming curing and sealing compound specified above, applied at not less than the manufacturer's specified and recommended rate and in accordance with manufacturer's written instructions.
   b. Apply a minimum of two coats at right angles, strictly in accordance with the sealer manufacturer's written application instructions and recommendations, for a uniform, low gloss sheen finish.
   c. In addition, all floor slabs shall be covered with blankets for a minimum of 72 hours after pouring.
   d. After curing compound has fully dried per manufacturer's recommendations, Contractor shall cover such slab surfaces with protective sheeting as necessary to avoid damage due to subsequent construction work and prior to final finishing of such floor surfaces as specified below.

F. Protection from mechanical injury:

1. During the curing period, protect all concrete during period from damaging mechanical disturbances, more especially load stresses, heavy shock, and excessive vibration.
2. Protect finished concrete surfaces from damage from construction equipment, materials and methods, from application of curing procedures, and from rain and running water.
3. Do not load self-supporting structures in such a way as to overstress the concrete.

END OF SECTION 033450

SECTION 040650 – MASONRY MORTAR & GROUT

PART 1 - GENERAL

1.1 DESCRIPTION

A. GENERAL REQUIREMENTS

1. Drawings and general provisions of the Contract Documents including General, Supplementary and other Conditions and Division 1, “General Requirements” Sections, apply to the work specified in this Section.

B. RELATED WORK IN OTHER SECTIONS

1. Unit masonry work covered under Section 042200.

1.2 QUALITY ASSURANCE

A. INSPECTIONS & TESTS

1. Field testing of grout and pre-construction and construction-site testing of mortar.
2. Contractor shall furnish mortar and grout materials for testing; follow Architect’s directions for any required jobsite alterations to mortar and grout mixes.

1.3 SUBMITTALS

A. MATERIAL, MIX CERTIFICATES

1. If mortar and grout are plant-mixed, furnish certificate from supplier attesting to compliance with specified requirements.

B. SAMPLES

1. Provide samples of mortar as part of sample panels specified to be provided under Section 042200.

1.4 PRODUCT DELIVERY, STORAGE & HANDLING

A. JOBSITE MATERIAL STORAGE

1. Store under roof, off ground; protect from elements.

1.5 JOB CONDITIONS

A. COLD WEATHER WORK

1. If temperature of outside air is below 40 degrees F., heat water and/or aggregates to produce mortar temperature between 40 and 100 degrees F. Maintain control of mortar material temperatures to avoid flash set by use of trial mixes, as approved.

PART 2 - PRODUCTS

2.1 MATERIALS

A. GENERAL

1. Conform to ASTM C270 for unit masonry mortar, ASTM C476 for grout.

B. PORTLAND CEMENT

1. ASTM C150, Type II; gray color for all work.

C. LIME

1. Hydrated lime ASTM C207, Type S.

D. MORTAR AGGREGATE

1. Furnish ASTM C144 clean, sharp, well-graded aggregate free from injurious amounts of dust, lumps of shale, alkali, surface coatings, and organic matter.

E. GROUT AGGREGATE

1. For fine grout, furnish fine aggregate meeting grading requirements of ASTM C404 Table I, size 1, 3/8-inch maximum.

F. WATER

1. Clean, potable, fresh.

G. MORTAR COLOR

1. As directed and approved by Architect.

H. ADMIXTURES

1. Anti-Freeze Compounds: Liquid, salts, or other substances to lower the freezing point in mortar NOT permitted.

2.2 MORTAR TYPES FOR UNIT MASONRY WORK

A. GENERAL

1. All mortar compressive strengths and types listed hereinafter for various uses shall be those conforming to and referenced in ASTM C270 for all masonry.
2. Measure materials for mortar in method that specified or designed proportions can be controlled and accurately maintained.

B. COMPRESSIVE STRENGTHS

1. Mortar TypeAverage Compressive ASTM C270 Strength at 28 Days psi Type M 2500 psi

C. MORTAR PROPORTIONS (PARTS) BY VOLUME (C270)

1. Mortar Type M:
   Portland cement : 1
   Hydrated lime or lime putty : 1/4
   Aggregate, damp, loose,
   passing a 16 mesh sieve : 2-1/4 to 3 times sum of cement and lime volumes.
2. Mortar Design: Exact proportions of mortar mixes specified herein to be determined by an approved independent laboratory using ingredients proposed to be furnished on the work and following procedures set forth for pre-construction evaluation of mortar mixes.

2.3 GROUT TYPES FOR REINFORCED MASONRY WORK

A. GENERAL

1. Grout compressive strengths and types listed hereinafter for various uses shall be those conforming to and referenced in ASTM C476.
2. Design to attain (1) minimum compressive strength of 2500 psi in 28 days, average of three 3-1/2 x 3-1/2 x 7 inch cubes, (2) water retention (flow after suction, min., percent of original flow) of 70, and (3) air content (volume, max. percent) of 18.
3. Measure materials for grout in method that specified or designed proportions can be controlled and accurately maintained.

B. GROUT PROPORTIONS (PARTS) BY VOLUME (C476)

1. Fine Aggregate Grout: Portland cement : 1
   Hydrated lime or lime putt : 0 to 1/10
   Fine aggregate, damp, loose : 2-1/4 to 3 times sum of cement and lime volumes.

2.4 MORTAR & GROUT MIXING

A. MACHINE MIXING

1. Mix mortar for a minimum period of three minutes, mix grout for five minutes minimum; mix in as approved mechanical batch mixer.

B. HAND MIXING

1. For small batches of setting mortar and grout only, then only upon approval of Architect.

C. MORTAR WORKABILITY & CONSISTENCY

1. Maintain mortar on the board sufficiently plastic to produce easy working with trowel, use water only in minimum quantity for workability.
2. Discard mortar mixed in excess of two hours before placing.
3. Do not re-temper mortar at the mixer.

D. GROUT CONSISTENCY

1. Maintain 5-8 inch slump for grout used for units with low absorption and up to 10-inch slump for high absorption units.
2. Do not add water unless given specific approval by special inspector at the jobsite.

PART 3 - EXECUTION

3.1 APPLICATION

A. MORTAR TYPES & USES

1. Use Type M mortar for all masonry work.

B. GROUT TYPES & USES

1. Use fine grout for grouting voids of concrete masonry unit block work.

3.2 FIELD QUALITY CONTROL

A. INSPECTIONS & TESTS

1. Field inspection and testing shall be performed. Contractor shall comply with the requirements of the Owner's testing and inspection agency.
   a. General: Independent laboratory to test exact proportions of mortar mixes using the same aggregate and other materials furnished by Contractor proposed to be used on the work; material samplings shall comply with ASTM C780, Article 9, "Sampling".
   b. Pre-construction evaluation of mortars:
      i. Provide pre-construction evaluation of mortars in compliance with ASTM C780 using test methods and procedures specified therein in Annexes A1 through A7, inclusive.
      ii. Under test method Annex A6, test mortar mixes for compliance with specified compressive strengths.
      iii. Should test specimens fail to meet specified compressive strengths, immediately notify Architect and Contractor.
   c. Construction-site evaluation of mortars:
      i. Take three 2 x 4 inch cylinder specimens for each 30 cu. yd. of mortar or fraction thereof being placed each day.
   d. Test mortar specimens for compliance with specified compressive strengths as indicated on Structural Drawings.
   e. Should test specimens fail to meet specified compressive strengths, immediately notify Architect and Contractor; perform further testing of construction-site mortar when so directed by Architect.

END OF SECTION 040650

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Drawings and general provisions of the Contract Documents including General, Supplementary and other Conditions and Division 01, “General Requirements” Sections, apply to the work specified in this Section.

B. Related Work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division I of these specifications.
2. Reinforcing steel for dowels for tying masonry work to foundation wall construction specified under Section 032000.
3. Mortar and grout covered under Section 040650.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Inspections and Tests

1. Periodic special on-site inspection/observation by the Testing Agency is required during placement of reinforced and/or fully grouted concrete masonry. Tests will be performed as required by International Building Code, as adopted by the local jurisdiction having authority and these specifications.
2. Inspections: Will include, but not necessarily be limited to, the following:
   a. Check reinforcing steel in place.
   b. Inspect all cells and clean-outs.
   c. Inspect grouting operation.
   d. Refer to Structural Notes for additional inspection requirements.
3. Testing: Will include, but not necessarily be limited to, the following:
   a. Test materials for compliance with specifications.
   b. A set of masonry prisms shall be built and tested in accordance with IBC Section 2105 prior to the start of construction. Materials used for the construction of the prisms shall be taken from those specified to be used in the Project. Prisms shall be constructed under the observation of the engineer or special inspector or an approved agency and tested by an approved agency.
   c. A set of three (3) prisms shall be built and tested during construction in accordance with IBC Section 2105 for each 5,000 square feet of wall area, but not less than one (1) set of three (3) prisms for the Project.
   d. Make report of test results in writing and expedited to Contractor, Architect, Owner, and Structural Engineer. Include in test reports the project identification name and number, date, name of subcontractor, name of testing service and identification number.

C. Pre-Installation Meeting

1. Approximately two weeks prior to scheduled commencement of masonry installation and associated work, meet at project site with masonry subcontractor, associated finish coatings Installer(s), Architect, Owner, and other representatives directly concerned with performance of the work including (as applicable) test agencies and governing authorities.
2 Review foreseeable methods and procedures related to masonry work, including, but not necessarily limited to, the following:
   a. Inspect and discuss condition of substrates, penetrations and other preparatory work performed by other trades.
   b. Review masonry requirements (drawings, specifications, and other contract documents).
   c. Review required submittals, both completed and yet to be completed.
   d. Review and finalize construction schedule related to masonry work and verify availability of materials, Installer's personnel, equipment and facilities needed to make progress and avoid delays.
   e. Review required inspection, certifying and material usage accounting procedures.
   f. Review weather and forecasted weather conditions as they may apply, and procedures for coping with unfavorable conditions, including requirements for temporary protection.

1.3 SUBMITTALS

A. Certificates

1. For masonry work furnish for approval, attesting conformance to specified ASTM Designation and Type for each different type masonry unit.

B. Manufacturer's Data

1. Furnish product information for masonry products. Include manufacturer's specifications including installation instructions and general recommendations for the type of products required.

C. Samples

1. Sample Units: Where products proposed to be furnished are different than products specified, furnish one (1) sample board of each such unit type, of colors and textures required, for approval. Product samples not required where furnishing specified product.

D. Masonry Reinforcement Shop Drawings

1. Contractor shall be responsible for providing masonry reinforcement shop drawings for all concrete masonry unit walls.
3. Detail, fabricate and place per ACI 315. Reinforcing shop drawing elevations shall show all vertical and horizontal reinforcing layouts; special reinforcement at lintels and jambs at doors, windows, mechanical openings, and as called out on Structural Drawings. Care shall be taken to locate mechanical and plumbing penetrations away from wall jambs and lintels.

E. Shop drawings are interpretations of and are supplemental to the design drawings and specifications. Their intent is to demonstrate to Architect that this Contractor has understood the design concept, and to provide detailed information necessary for the fabrication,

assembly, and installation of the products and materials specified. Neither the shop drawings nor comments placed on them by the Architect shall be construed as being change orders.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver all materials dry; store all materials at site off ground, adequately covered to protect from moisture and other damage until placed in the work.

B. Contractor shall allow for and discard all chipped or broken masonry.

1.5 JOB CONDITIONS

A. Protection of Work, Weather and Work Suspensions

1. Wet Weather: General Contractor shall provide and maintain approved protective cover over exposed masonry work during placing and after placement, until such construction is sealed. Contractor shall cover top of all masonry work with minimum 10 mil visqueen sheeting, properly secured, to protect the work from filling up with rain water or other precipitation until the final capping of such work occurs.
2. Cold Weather: When temperature is or expected to be below 40° F during and for 48 hours after placing, heat materials and provide adequate enclosures to maintain temperature above 40° F; obtain approval of protection methods prior to proceeding. Protect all masonry from calcium chloride in mortar for any masonry work. See IBC Section 2104 for additional cold weather construction requirements.
3. Hot Weather: Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of 90° F in the shade, with relative humidity less than 50%.

B. Cooperation with Other Trades

1. Obtain exact sizes of openings for ducts and pipes specified in other Sections; properly build around same. Build in and coordinate with and for work furnished by other trades as required; ductwork man-way restraints and their anchors, bolts, inserts, shelf angles, and other items as shown.
2. Coordination with Water Repellent Work: All coordination necessary with water repellent coating applicator as required to ensure all such application work is fully accomplished in a timely and proper manner, is the sole responsibility of the General Contractor. As a part of such coordination, General Contractor shall provide all new masonry construction with complete and proper protection from precipitation as specified above, both during and following masonry wall construction, until the sealing process is complete.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete Masonry Block & Veneer Units

1. Provide lightweight hollow load-bearing concrete masonry units complying with ASTM C-90, moisture controlled units texture, shape and color as directed and approved by the

Architect. Standard grey units may be used where they are totally concealed from view. See Architectural drawings for layup pattern and mortar joint locations.

a. The maximum moisture content of masonry block units shall be as follows:

Linear Shrinkage, %	Moisture Content, Max, % of Total Absorption (Average of 3 Units)
0.03 or less	35
From 0.03 to 0.045	30
0.045 to 0.065 max	25

2. Dimensions:
   a. Provide units of the dimensions shown on the Drawings.
   b. Where dimensions are not shown on the Drawings, provide units having nominal face dimensions of 16" long by 8" high by the depth shown or otherwise required.
3. Provide accessory shapes as indicated or otherwise required.

B. Bars for Vertical & Horizontal Reinforcing

1. Furnish vertical and horizontal reinforcing of ATM A615, Grade 6 0 . All reinforcing bars which are to be welded shall conform to ASTM A706. Use bars of sizes and quantities shown and noted shown and noted on Structural Drawings and related Details.
2. Furnishing and placement of dowels associated with masonry work, to be set into concrete structures as indicated on Structural Drawings and specified therefore under Section 032000, shall be the responsibility of masonry subcontractor for work of this Section.
3. Vertical bars to be of lengths and laps as required for low-lift grout work in lifts not exceeding five feet; length of bar laps as shown on Drawings.
4. Furnish additional reinforcing as specified under Structural Notes or as otherwise indicated on Structural Drawings.
5. Bending of bars per ACI 318.
6. Wire reinforcement per ASTM A82.

E. Cleaning Solution

1. Furnish ProSoCo Inc. “600 Detergent” masonry cleaner, or approved.

PART 3 - EXECUTION

3.1 INSPECTION OF PRIOR WORK

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Inspect bearing surfaces and related work in place for existing conditions.

C. See that dowels, masonry anchors, shelf angles and weld plates, as applicable, are properly placed.

D. Check that hollow metal door frames are secured in place, and are ready to receive grout as specified herein.

E. If deficiencies or errors are found, notify those trades responsible that corrections are made as approved before starting work.

3.2 PREPARATION

A. Preparation for New Masonry Installation

1. Clean top surfaces of existing bearing surfaces and work in place removing all foreign material before starting or resuming work.
2. Wet masonry units only as required to assure watertight mortar joint bond.
3. See that building wrap moisture barrier is installed to backup wall substrates as shown and specified.

3.3 MASONRY INSTALLATION

A. Workmanship, General

1. Except as otherwise noted or indicated, lay all work to true plumb and level lines, maintaining established approved module, coursing patterns and uniform joints for each type of work shown. Use story pole for vertical coursing dimensions.
2. Use stock units wherever possible; where cutting required use high speed masonry power saw. Masonry units utilized on an exposed finish surface shall be free of chips, breakage, or other imperfections.
3. Unless otherwise noted, lay all masonry work in a full bed of mortar, head and vertical joints completely filled. Use mortar and grout types specified herein and under Section 040650 for the work and as described hereinafter.
4. Install reinforcing, ties, and anchors for work of other trades as work proceeds.
5. Provide complete coordination of installation of mechanical plumbing, electrical conduit, and the like.
6. Unless otherwise specified hereinafter, omit filling joints with mortar in joints of the following types: Expansion, control and seismic.
7. Cut and remove split face to a smooth finish as required at surfaces abutting door and window framing, as applicable; elsewhere where shown.

B. Concrete Masonry Block Unit Installation

1. General
   a. Lay units by face shell bedding method, in running bond with full head joints conforming to IBC Section 2104, of masonry type, face pattern, and size courses as directed by the Architect for the various wall structures.
   b. Install units with all open cells placed vertically.
   c. Lay continuous bond beam courses in locations indicated.
   d. Make all joints approximately 3/8” width.
   e. Anchor units to wall and foundation structures as shown.
   f. Cap tops of exterior screen walls as directed by the Architect.
   g. Clean the top surface of foundation free from dirt, debris, and laitance, and expose the aggregate prior to start of installing first course.
   h. Accurately fit the units to plumbing ducts, openings, and other interfaces, neatly patching all holes.
   i. Keep the walls continually clean, preventing grout and mortar stains. If grout does run over, clean immediately.
   j. Do not use chipped or broken units. If such units are discovered in the finished wall, the Architect may require their immediate removal and replacement with new units at no additional cost to the Owner. Refacing of masonry units will be allowed only after written permission is given by the Architect.
2. Built-in Work

a. As the work progresses, build in built-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items, except at expansion/control joints.
b. Install reglets, control joints, veneer ties and reinforcement as work proceeds, as applicable, installed as shown for the various conditions and/or otherwise specified herein.
c. As the work proceeds, fill hollow metal frames solid with grout. Leave space between hollow metal frames and exterior masonry for subsequent application of sealant.

3. Finishing Mortar Joints
   a. Tool all joints with steel tool to a concave profile, as approved whether exposed or concealed.

D. INSTALLATION OF MASONRY REINFORCING

1. Install deformed reinforcing steel bars vertically and horizontally in cells of concrete masonry unit work, including bond beams, sized and spaced as shown, prior to grouting. Engage vertical reinforcing with "vertical bar positioners" and with bar dowels installed under work of Section 032000.
2. Provide reinforcement as shown on the Drawings, fully embedded in grout and not in mortar or mortar joints.
3. Install all other reinforcing as specified in Structural Notes or otherwise indicated on Drawings and related details.

E. LOW LIFT GROUT WORK

1. Install grout specified in Section 040650 in low lifts not exceeding 5 feet, completely filling all voids of CMU. Grout around vertical reinforcing, anchors, weld plates, etc.; at all bond beams install grout around horizontal reinforcing, completely filling bond beam voids. Install grout in cells of masonry units which are to receive wall mounted items and anchored with expansion type anchor bolts. All grout shall be vibrated and re-vibrated.

3.4 POINTING & CLEANING

A. Pointing – New Work

1. On completion of new work, point all exposed masonry work surfaces filling all holes and cracks. Remove all loose mortar and defective work and re-point as approved.

B. Cleaning

1. Clean all surfaces of concrete masonry unit surfaces which are to be left exposed. Clean surfaces with cleaning solution specified above.
2. Wet surfaces with water before applying cleaning solution; after application of cleaning solution, water rinse all solution off the surface.
3. Protect adjacent materials from damage from cleaning solution.
4. Leave all surfaces clean, free from mortar and all stains, ready for respective water repellent and paint coatings, as applicable.

END OF SECTION 042200

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Steel pipe railings.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

2.2 STEEL AND IRON

A. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations and where indicated.

B. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

2.3 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.4 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Form Changes in Direction as Follows:

1. By bending.

J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.5 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet .
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet .

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

3.4 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

3.5 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Provide wood, nails, bolts, screws, framing anchors and other rough hardware, and other items needed, and perform rough carpentry for the construction shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Codes and standards:

1. In addition to complying with the pertinent codes and regulations of governmental agencies having jurisdiction, unless otherwise specifically directed or permitted by the Architect, comply with:
   a. "Product Use Manual" of the Western Wood Products Association for selection and use of products included in that manual;
   b. "Plywood Specification and Grade Guide" of the American Plywood Association;
   c. "Standard Specifications for Grades of California Redwood Lumber" of the Redwood Inspection Bureau for Redwood, when used.
   d. “National Design Specifications for Wood Construction (NDS)” of the American Forest and Paper Association.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Protection:

1. Deliver the materials to the job site and store, in a safe area, out of the way of traffic, and shored up off the ground surface.
2. Identify framing lumber as to grades, and store each grade separately from other grades.
3. Protect metals with adequate waterproof outer wrapping.
4. Use extreme care in off loading of lumber to prevent damage, splitting, and breaking of materials.

PART 2 - PRODUCTS

2.1 GRADE STAMPS

A. Identify framing lumber by the grade stamp of the West Coast Lumber Inspection Bureau, or such other grade stamp as is approved in advance by the Architect.

B. Identify plywood as to species, grade, and glue type by the stamp of the American Plywood Association.

C. Identify other materials of this Section by the Appropriate stamp of the agency approved in advance by the Architect.

2.2 MATERIALS

A. Provide materials in the quantities needed for the Work shown on the Drawings, and meeting or exceeding the following standards of quality, unless otherwise noted on the drawings:

1. Horizontal framing members: Douglas Fir-Larch, NDS Table 4A or 4D, No. 1 or better for members larger than 2x10; NDS Table 4A or 4D, No. 2 or better for 2x10 and smaller members.
2. Vertical framing members: Douglas Fir-Larch, NDS Table 4A or 4D, No. 1, or better. Posts shall be Douglas Fir No. 1, or better.
3. Plates shall be Douglas Fir-Larch, NDS 4A or 4D, No. 1, or better. Nailers, bridging, and blocking: Douglas Fir-Larch NDS Table 4A, No. 2, or better.
4. Moisture content of framing lumber shall not exceed 19% by weight at time of installation.
5. Plywood: (PS-1 plywood bearing the APA trademark of the American Plywood Association.)
   a. Sheathing: Plywood or Oriented-Strand-Board sheathing with exterior glue, grades and sizes as shown on the Drawings.
   b. Backboard: 3/4" thick A/D, group 1, interior.
6. Wood Preservative: Ammoniacal copper arsenite, or 5% solution of pentachlorophenol. All wood in contact with earth, with concrete slabs on grade, and with concrete or masonry foundations shall be pressure preservatively treated Douglas Fir, or foundation grade redwood. All hangars and connections shall be nailed for maximum capacity. All framing anchors, connections, nails, etc. that are attached to pressure treated wood shall have the proper protective finish as required for that pressure treated material.
7. Rough hardware:
   a. Steel items:
      i. Comply with ASTM A7 or ASTM A36.
      ii. Use galvanized at exterior locations.
   b. Machine bolts: Comply with ASTM A307.
   c. Lag bolts: Comply with Fed Spec FF-B-561.
   d. Nails:
      i. Use common of the gage and size noted in NDS Table No. L4.
      ii. Comply with Fed Spec FF-N-1.
      iii. Use galvanized at exterior locations.
   e. Joist hangers: Simpson, Silver, or equal as approved by the Architect, having ICBO approval.
   f. All framing anchors, connections, nails, etc. that are attached to pressure treated wood shall have the proper protective finish as required for that pressure treated material.

8. Microlams: Microlam members shall be minimum 1.9 E D.F. "MICRO=LAM" as manufactured by Trus Joist, or approved equal, having ICBO approval.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which all work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 DELIVERIES

A. Stockpile materials sufficiently in advance of need to assure their availability in a timely manner for this Work.

B. Make as many trips to the job site as are needed to deliver materials of this Section in a timely manner to ensure orderly progress of the Work.

3.3 COMPLIANCE

A. Do not permit materials not complying with the provisions of this Section to be brought onto or to be stored at the job site.

B. Promptly remove non-complying materials from the job site and replace with materials meeting the requirements of this Section.

3.4 WORKMANSHIP

A. Produce joints which are tight, true, and well nailed, with members assembled in accordance with the Drawings and with pertinent codes and regulations.

B. Selection of lumber pieces:

1. Carefully select the members.
2. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing, and will allow making of proper connections.
3. Cut out and discard defects which render a piece unable to serve its intended function.
4. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive knots, splits, warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

C. Do not shim any framing component.

3.5 GENERAL FRAMING

A. General:

1. In addition to framing operations normal to the fabrication and erection indicated on the Drawings, install wood blocking and backing required for the work of other trades.
2. Set horizontal and sloped members with crown up.
3. Do not notch, cut, or bore members for pipes, ducts, or conduits, or for other reasons except as shown on the Drawings or as specifically approved in advance by the Architect. Cutting or notching of wood studs per IBC 2308.9.10 and 2308.9.11 will not be allowed.

B. Bearings:

1. Make bearings full unless otherwise indicated on the Drawings.
2. Finish bearing surfaces on which structural members are to rest so as to give sure and even support.
3. Where framing members slope, cut or notch the ends as required to give uniform bearing surface.

3.6 BLOCKING AND BRIDGING

A. Install blocking as required to support items of finish and to cut off concealed draft openings, both vertical and horizontal, between ceiling and floor areas. Also provide blocking at all unsupported wall sheathing edges, at edges of all roof and wall openings, and as required for a complete and proper installation.

B. Bridging:

1. Install wood cross bridging (not less than 2" X 3" nominal), metal cross bridging of equal strength, or solid blocking between joists where shown.
2. Cross bridging may be omitted for roof and ceiling joists where the omission is permitted by code, except where otherwise indicated on the Drawings.
3. Install solid blocking between joists at points of support, and where shown on the Drawings. Blocking may be omitted where joists are supported on metal hangers, unless shown otherwise on the Drawings.

3.7 ALIGNMENT

A. On framing members to receive a finished surface, align the finish subsurface to vary not more than 1/8" from the plane of surfaces of adjacent furring and framing members.

3.8 INSTALLATION OF PLYWOOD SHEATHING

A. Placement:

1. Place horizontal plywood with face grain perpendicular to supports and continuously over at least two supports, except where otherwise shown on the Drawings. Place vertical plywood with face grain parallel to supports with supports or blocking at all plywood edges.
2. Center joints accurately over supports, unless otherwise shown on the Drawings.

B. Protect plywood from moisture by use of waterproof coverings until the plywood in turn has been covered with the next succeeding component or finish.

3.9 FASTENING

A. Nailing:

1. Use only common wire nails or spikes of the dimensions shown on the Drawings and the IBC Nailing Schedule, except where otherwise specifically noted. Use deformed shank nails on all plywood wall sheathing receiving plaster.
2. For conditions not covered in the Nailing Schedule provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike, provided, however, that 16d nails may be used to connect two pieces of 2" (nominal) thickness.
3. Nail without splitting wood.
4. Prebore as required.
5. Remove split members and replace with members complying with the specified requirements.
6. Care shall be taken to ensure proper placing and nailing of all plywood for walls and roofs. Comply with the recommendations of the American Plywood Association, and as noted herein. Unless otherwise noted, provide 1/8" and 1/8" spacing for plywood sheathing at the end and edge joints respectively. Start nailing sheets of plywood at the end or side closest to the plywood sheet previously installed, and then progress with the nailing across the panel, from the initial side to the opposite side or end. Do not nail the four corners of the panel initially and then nail the field.

B. Bolting:

1. Drill holes 1/16" larger in diameter than the bolts being used.
2. Drill straight and true from one side only.
3. Do not bear bolt heads on wood, but use washers under head and nut where both bear on wood, and use washers under all nuts.

C. Screws:

1. For lag screws and wood screws, prebore holes same diameter as root of threads, enlarging holes to shank diameter for length of shank.

END OF SECTION 061000

SECTION 061900 - WOOD TRUSSES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide wood trusses where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. Refer to Structural General Notes for additional information.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
2. Section 061000: Rough Carpentry.

1.2 SUBMITTALS

A. Product data: Submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements including loading, minimum member sizes, shapes, etc.;
3. Shop Drawings showing species, sizes, and stress grades of lumber proposed to be used; pitch, span, camber, configuration, and spacing of trusses; connector type, thickness, size, location, and design value; and bearing details;
4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
5. Certification, signed by an officer of the fabricating firm, indicating that the trusses comply with the design and project requirements.
6. The shop drawings are interpretations of and are supplemental to the design drawings and specifications. Their intent is to demonstrate to the Architect that this Contractor has understood the design concept, and to provide the detailed information necessary for the fabrication, assembly and installation of the products or materials specified. Neither the shop drawings nor comments placed on them by the Architect shall be construed as being change orders.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

2.1 WOOD TRUSSES

A. Design:

1. Provide the services of a civil or structural engineer registered to practice in the State of Nevada. This engineer shall design the wood trusses to sustain the indicated loads for the spans, profiles, and arrangements shown on the Drawings, and shall stamp and seal the truss shop drawings. Total load deflection shall be limited to no more than L/240. Live load deflection shall be limited to no more than L/360.
   a. Comply with pertinent provisions of:
      i. "Timber Construction Standards" of the American Institute of Timber Construction;
      ii. "Quality Control Manual" of the Truss Plate Institute;
      iii. The building code having jurisdiction.
2. Fabrication:
   a. Prefabricate in strict accordance with the Shop Drawings and other data approved by the Architect.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use.

1. Hoist the trusses into position with proper bracing secured at designated lifting points.
2. Exercise care to keep out-of-plane bending of trusses to a minimum.
3. Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing is installed.
4. Install permanent bracing and related components prior to application of loads to trusses.
5. Tighten loose connectors.

6. Restrict construction loads to prevent overstressing of truss members.
7. Do not cut or remove truss members.

END OF SECTION 061900

SECTION 071416 - COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Latex-rubber waterproofing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.

1. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
2. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.

B. Maintain adequate ventilation during application and curing of waterproofing materials.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations for Waterproofing System: Obtain waterproofing materials molded-sheet drainage panels from single source from single manufacturer.

2.2 LATEX-RUBBER WATERPROOFING

A. Two-Component, Unreinforced, Latex-Rubber Waterproofing: ASTM C 836/C 836M; coal-tar free.

1. Products: Subject to compliance with requirements, provide the following:

a. Procor 20 Trowel Grade by W.R. Grace & Co.

2. Hydrostatic-Head Resistance: 65 feet minimum; ASTM D 5385.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with one another and with waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

2.4 MOLDED-SHEET DRAINAGE PANELS

A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 18 gpm per ft. .

1. Products: Subject to compliance with requirements, provide the following:

a. Hydroduct 220 by W.R. Grace & Co.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.

3.3 PREPARATION AT TERMINATIONS, PENETRATIONS, AND CORNERS

A. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 1471.

B. Apply waterproofing in two separate applications, and embed a joint reinforcing strip in the first preparation coat when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Comply with ASTM C 1193 for joint-sealant installation.
2. Apply bond breaker on sealant surface, beneath preparation strip.

3.5 WATERPROOFING APPLICATION

A. Apply waterproofing according to manufacturer's written instructions and to recommendations in ASTM C 1471.

B. Unreinforced Waterproofing Applications: Mix materials and apply waterproofing by spray, roller, notched squeegee, trowel, or other application method suitable to slope of substrate.

1. Apply one or more coats of waterproofing to obtain a seamless membrane free of entrapped gases and pinholes, with a dry film thickness of 60 mils .
2. Apply waterproofing to prepared wall terminations and vertical surfaces.
3. Verify manufacturer's recommended wet film thickness of waterproofing every 100 sq. ft. .

C. Cure waterproofing, taking care to prevent contamination and damage during application and curing.

3.6 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

3.7 PROTECTION

A. Protect waterproofing from damage and wear during remainder of construction period.

B. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 071416

SECTION 074113 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes standing-seam metal roof panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches .

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.7 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.8 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 30 years from date of Substantial Completion.

C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 or ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft.

B. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 or ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference 6.24 lbf/sq. ft..

C. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.

2.2 STANDING-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

B. Trapezoidal-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together. Provide the following or equal:

1. Products: Klip-Rib by AEP Span

2. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 0.022 inch (24 Gauge).
b. Exterior Finish: Two-coat fluoropolymer.
c. Color: As selected by Architect from manufacturer's full range.

3. Clips: One-piece fixed to accommodate thermal movement.

a. Material: 0.028-inch-(21 Gauge) nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

4. Panel Coverage: 16 inches.
5. Panel Height: 1-5/8".

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F ; ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F ; ASTM D 1970.
3. Products: Subject to compliance with requirements, provide the following or equal:

a. Grace Ice & Water Shield HT

2.4 MISCELLANEOUS MATERIALS

A. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

C. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.

D. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot-long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.

E. Roof Curbs: Fabricated from same material as roof panels, with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of 0.060-inch-nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.

1. Insulate roof curb with 1-inch-thick, rigid insulation.

F. Panel Fasteners: Self-tapping screws designed to withstand design loads.

G. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

2.5 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to

exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil .

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated on Drawings, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the entire roof surface.

3.4 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.

3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Watertight Installation:

    a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
    b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet

metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.

J. Roof Curbs: Install flashing around bases where they meet metal roof panels.

K. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Mildew-resistant joint sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.5 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F .
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:

1. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 775 g/L or less.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; 790
b. GE Silicones; SCS 9000
c. Tremco: Spectrem I
d. Pecora 890

2.3 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation; 898
b. Tremco: Tremsil 200
c. Dow 999A
d. GE Silpruf SCS-1700

2.4 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. CMU.

    b. Wood.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage

or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes hollow-metal work.

B. Related Requirements:

1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Maximum-Duty Doors and Frames: SDI A250.8, Level 4. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches
c. Face: Metallic-coated steel sheet, minimum thickness of 0.067 inch , with minimum A40 coating.
d. Edge Construction: Model 2, Seamless.
e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.

3. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch , with minimum A40 coating.
b. Construction: Face welded.

4. Exposed Finish: Prime.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch , and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.4 MATERIALS

A. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

B. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

E. Grout: ASTM C 476, except with a maximum slump of 4 inches , as measured according to ASTM C 143/C 143M.

F. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

G. Glazing: Comply with requirements in Section 088000 "Glazing."

H. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches .
2. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
3. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
4. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
3. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with [**butted**] [or] [**mitered**] hairline joints.

1. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
2. Provide loose stops and moldings on inside of hollow-metal work.
3. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.7 ACCESSORIES

A. Louvers: Provide louvers for exterior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch-thick, cold-rolled steel sheet set into 0.032-inch-thick steel frame.

1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    c. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    d. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch , measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch , measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch , measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch , measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

    a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch .
    b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch .
    c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch .
    d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch .

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Access doors and frames for walls and ceilings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details materials, individual components and profiles, and finishes.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.
2. Detail fabrication and installation of access doors and frames for each type of substrate.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

C. Flush Access Doors with Exposed Flanges:

1. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.
2. Locations: Ceiling.
3. Door Size: 24 inches x 36 inches
4. Uncoated Steel Sheet for Door: Nominal 0.060 inch , 16 gage.

a. Finish: Factory prime.

5. Frame Material: Same material, thickness, and finish as door.
6. Hinges: Manufacturer's standard.

7. Hardware: Latch.

D. Hardware:

1. Latch: Self-latching bolt operated by screwdriver with interior release.

2.2 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

C. Frame Anchors: Same type as door face.

D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.

1. Provide mounting holes in frames for attachment of units to metal or wood framing.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Steel and Metallic-Coated-Steel Finishes:

1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
2. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil for topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

2. Electrified door hardware.

B. Related Sections:

1. Section 081113 "Hollow Metal Doors and Frames"

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Details of electrified door hardware, indicating the following:

1. Wiring Diagrams: For power, signal, and control wiring and including the following:

a. Details of interface of electrified door hardware and building safety and security systems.
b. Schematic diagram of systems that interface with electrified door hardware.
c. Point-to-point wiring.
d. Risers.
e. Elevations doors controlled by electrified door hardware.

2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
c. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
d. Content: Include the following information:

1) Identification number, location, hand, fire rating, size, and material of each door and frame.
2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
5) Fastenings and other pertinent information.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) List of related door devices specified in other Sections for each door and frame.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For electrified door hardware, from the manufacturer.

C. Warranty: Special warranty specified in this Section.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware schedule.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Source Limitations: Obtain each type of door hardware from a single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf .
2. Comply with the following maximum opening-force requirements:

   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
   b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
   c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

F. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.8 COORDINATION

A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.

a. Electromagnetic Locks: Five years from date of Substantial Completion.
b. Manual Closers: 10 years from date of Substantial Completion.

1.10 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Provide parts and supplies that are the same as those used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by descriptive titles corresponding to requirements specified in Part 2.

2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Hager
b. McKinney Products Company
c. Stanley Commercial Hardware; Division of The Stanley Works

B. Antifriction-Bearing Hinges:

1. Mounting: Full mortise (butts).
2. Bearing Material: Ball bearing.
3. Grade: Grade 1 (heavy weight).
4. Base and Pin Metal:

a. Exterior Hinges: Stainless steel with stainless-steel pin.
b. Interior Hinges: Stainless steel with stainless-steel pin.

5. Pins: Maximum security.
6. Tips: Flat button.
7. Corners: Square.

2.3 MECHANICAL LOCKS AND LATCHES

A. Bored Deadbolt Locks: BHMA A156.5: Grade 1 with strike that suits frame.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Schlage Deadbolt B663P

2. Backset: 2-3/4 inches .
3. Material: Stainless steel.
4. Deadlocks: Deadbolt operated by key outside and turn inside.

2.4 ELECTROMAGNETIC LOCKS

A. Electromagnetic Locks: BHMA A156.23; electrically powered; with electromagnet attached to frame and armature plate attached to door; full-exterior or full-interior type, as required by application indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Securitron-Assa Abloy - SAM

2. Shear Type: Lock mortised in header; strike mortised in top of door.
3. Strength Ranking: 1200 lbf .

2.5 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

B. High-Security Lock Cylinders: BHMA A156.30; Grade 1; Type M, mechanical; permanent cores that are removable; face finished to match lockset.

1. Number of Pins: Seven.
2. Type: Bored-lock type.

C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.6 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.

1. Existing System:

a. Master key or grand master key locks to Owner's existing system.

2. Keyed Alike: Key all cylinders to same change key.

B. Keys: Brass.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: Information to be furnished by Owner.

2.7 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Ives
b. Trimco
c. Don-Jo Mfg., Inc.
d. Hager Companies
e. Rockwood Manufacturing Company

B. Flat Push Plates: 0.050 inch thick, 4 inches wide by 16 inches high with square corners and beveled edges; secured with exposed screws.

C. Straight Pull-Plate Door Pulls: 0.050-inch-thick plate, 4 inches wide by 16 inches high with square corners and beveled edges; pull with minimum clearance of 1-1/2 inches from face of door.

1. Type: 1-inch constant-diameter pull.
2. Mounting: Surface applied with concealed fasteners.
3. Overall Pull Length: 10 inch.

2.8 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. LCN
b. Norton

B. Cast-Aluminum Surface Closers: Grade 1; Traditional Type with mechanism enclosed in cast-aluminum alloy shell.

1. Mounting: Parallel arm.
2. Type: Heavy Duty Arm.
3. Backcheck: Adjustable, effective between 60 and 85 degrees of door opening.
4. Mounting Method: Vandal Resistant Torque Fasteners

2.9 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Pemko
b. Rixson Specialty Door Controls
c. National Guard Products, Inc.

B. Adhesive-Backed Perimeter Gasketing: Vinyl bulb gasket material applied to frame rabbet with self-adhesive.

C. Combination Door Shoe/Kick Plate: Thermoplastic elastomer gasket material held in place by aluminum housing; mounted to bottom edge of door with screws.

1. Extended Housing: Both sides of door up 3 inches.
2. Mounting: Surface mounted on bottom edge of door.

2.10 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Pemko
b. Rixson Specialty Door Controls
c. National Guard Products, Inc.

B. Saddle Thresholds:

1. Type: Fluted top, barrier free.
2. Base Metal: Aluminum.

2.11 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Auxiliary Electrified Door Hardware:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Securitron – Assa Abloy

b. Tyco Electronics Connectivity Potter & Brumfield Relays

c. Honeywell

B. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; listed and labeled for use with fire alarm systems.
1. Securitron BPS-24-4
a. Power Supply 24VDC – 4 Amp
b. Polyswitch (PTC) 2A circuit breakers
c. LEDs monitor zone status (voltage, no voltage)
d. Sealed lead acid-gel battery charging – battery included
e. Rugged steel enclosure
f. Provided with terminals for fire alarm relay connection
g. Clean linear power for flawless operation with all sensitive active electronic components.
h. BPS UL Listed

C. Push Button: For manual release of Shear Aligning Electromagnetic Lock:
1. Securitron PB4L-2
a. Momentary, Single Gang, Green Illuminated Halo
b. 4 Amp rated contacts
c. Bi-color LED
d. Vandal and tamper resistant
e. Stainless Steel single gang plate: 4-1/2” x 2-3/4”
f. Lifetime Replacement No Fault Warranty

D. Timer: Extends the hold-open request of push button, enabling single-hand operation of door with Shear Aligning Electromagnetic Lock.
   1. Securitron TM-9 Time Mate Timer
      a. Miniature Timer extends momentary switches
      b. Fits in outlet box with Push Button
      c. 3 Amp SPDT relay energizes for 2 to 36 seconds.
      d. Time setting is selected by easy to configure DIP switches
      e. Lifetime Replacement No Fault Warranty

E. Latching Relay: Allows for integration and operation with time clock – see electrical drawings (utilize fire alarm circuit within Boxed Power Supply:
   1. Tyco Electronics Connectivity Potter & Brumfield Relays: 24 VAC Latching Relay S89R-Part No. 4-1393134-5:
      a. Description: Relay Impulse DPDT 15A 24V
      b. Coil Type: Latching, Single Coil
      c. Coil Current: 375mA
      d. Coil Voltage: 24VAC
      e. Contact Form: DPDT (2 Form C)
      f. Contact Rating: 15A
      g. Switching Voltage 277VAC-Max
      h. Turn on Voltage (Max): 20.4 VAC

F. Request to Exit Device: Senses motion for emergency release of Electromagnetic Lock.
   1. Visonic – From Tyco Security Product: SPY Micro-PIR Detectors: SPY 3
      a. Ceiling Mount
      b. Wide Angle
      c. Operating Voltage: 10 to 14 VDC
      d. Standby Current Drain: 12.5mA at 12VDC

2.12 FABRICATION

A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

   1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
   2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
   3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.13 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches .

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.

F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, in equipment room. Verify location with Architect.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

I. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.7 DOOR HARDWARE SCHEDULE

GROUP H1

Exterior Steel-Single (Door 101)

Quan	Item	Description	Manufacturer
2	DEADBOLT LOCKS	B663P X US32D	SCHLAGE
	Mount deadbolt locks at 16 inches and 52 inches from finish floor on door		
1	PULL PLATE	8303-0-US32D-4”X16”-G	IVES
1	PUSH PLATE	8300-0-US32D-4”X16”-G	IVES
4	HINGES	BB1168 4.5x4.5 US32D NRP	HAGER
1	WEATHERSTRIP	PK55BL	PEMKO
1	DOOR BOTTOM	221PK	PEMKO
1	THRESHOLD	2748A	PEMKO
1	CLOSER	4040-62PA-3077EDA-72MC	LCN

GROUP H2

Interior Steel-Single (Door 102)

Quan	Item	Description	Manufacturer
1	DEADBOLT LOCK	B663P X US32D	SCHLAGE
1	PULL PLATE	8303-0-US32D-4”X16”-G	IVES
1	PUSH PLATE	8300-0-US32D-4”X16”-G	IVES
3	HINGES	BB1168 4.5x4.5 US32D NRP	HAGER
1	WEATHERSTRIP	PK55BL	PEMKO

GROUP H3

Exterior Steel-Single (Door 103)

Quan	Item	Description	Manufacturer
2	DEADBOLT LOCKS	B663P X US32D	SCHLAGE
	Mount deadbolt locks at 16 inches and 52 inches from finish floor on door		
1	PULL PLATE	8303-0-US32D-4”X16”-G	IVES
1	PUSH PLATE	8300-0-US32D-4”X16”-G	IVES
3	HINGES	BB1168 4.5x4.5 US32D NRP	HAGER
1	WEATHERSTRIP	PK55BL	PEMKO
1	DOOR BOTTOM	221PK	PEMKO
1	THRESHOLD	2748A	PEMKO
1	CLOSER	4040-62PA-3077EDA-72MC	LCN
1	ELECTROMAG. LOCK	SAM	SECURITRON
1	PUSH BUTTON	PB4L-2	SECURITRON
1	TIMER	TM-9	SECURITRON
1	REQUEST TO EXIT	SPY-3	VISONIC
1	BOXED POWER SUPPLY	BPS-24-4	SECURITRON
1	LATCHING RELAY	S89R- Part No. 4-1393134-5	TYCO

GROUP H4

Exterior Steel-Single (Door 104)

Quan	Item	Description	Manufacturer
2	DEADBOLT LOCKS	B663P X US32D	SCHLAGE
	Mount deadbolt locks at 16 inches and 52 inches from finish floor on door		
1	PULL PLATE	8303-0-US32D-4”X16”-G	IVES
1	PUSH PLATE	8300-0-US32D-4”X16”-G	IVES
3	HINGES	BB1168 4.5x4.5 US32D NRP	HAGER
1	WEATHERSTRIP	PK55BL	PEMKO
1	DOOR BOTTOM	221PK	PEMKO
1	THRESHOLD	2748A	PEMKO
1	CLOSER	4040-62PA-3077EDA-72MC	LCN

GROUP H5

Exterior Steel-Single (Door 105) – utilize boxed power supply in Group 3

Quan	Item	Description	Manufacturer
2	DEADBOLT LOCKS	B663P X US32D	SCHLAGE
	Mount deadbolt locks at 16 inches and 52 inches from finish floor on door		
1	PULL PLATE	8303-0-US32D-4”X16”-G	IVES
1	PUSH PLATE	8300-0-US32D-4”X16”-G	IVES
3	HINGES	BB1168 4.5x4.5 US32D NRP	HAGER
1	WEATHERSTRIP	PK55BL	PEMKO
1	DOOR BOTTOM	221PK	PEMKO
1	THRESHOLD	2748A	PEMKO
1	CLOSER	4040-62PA-3077EDA-72MC	LCN
1	ELECTROMAG. LOCK	SAM	SECURITRON
1	PUSH BUTTON	PB4L-2	SECURITRON
1	TIMER	TM-9	SECURITRON
1	REQUEST TO EXIT	SPY -3	VISONIC
1	LATCHING RELAY	S89R- Part No. 4-1393134-5	TYCO

END OF SECTION 087100

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Tile backing panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, provide the following:

a. DensShield by Georgia-Pacific

2. Core: 5/8 inch , Type X.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.3 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.3 APPLYING TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at showers, tubs, and where indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.

3.4 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 5: Ceiling.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.5 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Galvanized metal.
2. Aluminum (not anodized or otherwise coated).

B. Related Requirements:

1. Section 099600 "Anti Graffitti Coatings" for special-use coatings.
2. Section 099123 "Interior Painting" for surface preparation and the application of paint systems on interior substrates.
3. Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on exterior wood substrates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F .

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F .

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Sherwin-Williams Company
2. ICI Paints
3. Kelly-Moore Paints
4. Benjamin Moore & Co.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

C. Colors: As selected by Architect from manufacturer's full range.

2.3 METAL PRIMERS

A. Primer, Galvanized: As recommended in writing by topcoat manufacturer.

B. Primer, Quick Dry, for Aluminum - as recommended in writing by topcoat manufacturer:

2.4 WATER-BASED PAINTS

A. Light Industrial Coating, Exterior, Water Based (Gloss Level 3):

1. DTM (Direct to Metal) Acrylic Coating.

2.5 ALUMINUM PAINT

A. Aluminum Paint:

1. DTM (Direct to Metal) Acrylic Coating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

B. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

C. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

D. Aluminum Substrates: Remove loose surface oxidation.

3.3 APPLICATION

A. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Galvanized-Metal Substrates: Hollow Metal Doors/Frames, Handrails

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
c. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3).

B. Aluminum Substrates: Mechanical Louvers

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, quick dry, for aluminum.
b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
c. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3).

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete masonry units (CMU).
2. Galvanized metal.
3. Gypsum board.

B. Related Requirements:
1. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
2. Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. VOC content.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F .

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F .

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Sherwin-Williams Company
2. ICI Paints
3. Kelly-Moore Paints
4. Benjamin Moore & Co.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.3 BLOCK FILLERS

A. Block Filler, Latex, Interior/Exterior:

1. Sherwin-Williams: LOXON Block Surfacer – or equal.

2.4 PRIMERS/SEALERS (Gypsum Board)

A. Primer Sealer, Interior, Institutional Low Odor/VOC:

1. Sherwin-Williams: All Surface Enamel Latex Primer – or equal.

2.5 METAL PRIMERS

A. Primer, Galvanized, Water Based:

1. Sherwin-Williams: All Surface Enamel Latex Primer – or equal.

2.6 WATER-BASED EPOXY PAINTS

A. Light Industrial Epoxy Coating, Interior, Water Based Epoxy, Semi-Gloss (Gloss Level 5):

1. Sherwin-Williams: Pro Industrial Pre-Catalyzed Water Based Epoxy – or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Masonry (Clay and CMU): 12 percent.
2. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in occupied spaces:

a. Metal conduit.
b. Other items as directed by Architect.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. CMU Substrates:

1. Water-Based Light Industrial Epoxy Coating System:

a. Block Filler: Block filler, latex, interior/exterior.
b. First Intermediate Coat: Block Filler: Block filler, latex, interior/exterior
c. Second Intermediate Coat: Light industrial epoxy coating, water based epoxy matching top coat.
d. Topcoat: Light industrial coating, water based epoxy, semi-gloss (Gloss Level 5).

B. Galvanized-Metal Substrates:

1. Water-Based Light Industrial Epoxy Coating Over Waterborne Primer System:

a. Prime Coat: Primer, galvanized, water based.
b. Intermediate Coat: Light industrial epoxy coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial epoxy coating, interior, water based, semi-gloss (Gloss Level 5).

C. Gypsum Board Substrates:

1. Water-Based Light Industrial Epoxy Coating System:

a. Prime Coat: Primer sealer, latex, interior.
b. Intermediate Coat: Light industrial epoxy coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial epoxy coating, interior, water based, semi-gloss (Gloss Level 5).

END OF SECTION 099123

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes surface preparation and application of wood finishes on the following substrates:

1. Exterior Substrates:

a. Exposed dimension lumber (rough carpentry).

B. Related Requirements:

1. Section 099113 "Exterior Painting" for standard paint systems on exterior substrates.
2. Section 099123 "Interior Painting" for stains and transparent finishes on concrete floors.
3. Section 099600 "High-Performance Coatings" for transparent high-performance coatings on cmu exterior walls.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of product indicated.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Stains and Transparent Finishes: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F .

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F .

B. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Sherwin Williams Company
2. ICI Paints
3. Kelly-Moore Paints
4. Benjamin Moore & Co.

2.2 MATERIALS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.

B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.

C. Stain Colors: As selected by Architect from manufacturer's full range.

2.3 STAINS

A. Stain, Exterior, Water Based, Semi-Transparent:

1. Sherwin Williams: SuperDeck Log Home & Deck Stain – or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with finish application only after unsatisfactory conditions have been corrected.

1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.

1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

3.3 APPLICATION

A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for finish and substrate indicated.

B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 EXTERIOR WOOD-FINISH-SYSTEM SCHEDULE

A. Wood substrates, nontraffic surfaces, including All Exposed Exterior Wood.

1. Semi-Transparent, Water-Based Stain System:

a. Intermediate Coat: Stain, exterior, water based, semi-transparent, matching topcoat.
b. Topcoat: Stain, exterior, water based, semi-transparent.

END OF SECTION 099300

SECTION 0 99 600 - ANTI-GRAFFITI COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes surface preparation and application of anti-graffiti coating systems for the following vertical surfaces:
   1. Exterior:
      a. Exposed CMU – unpainted

B. Related Sections include the following:
   1. Division 07 Section "Joint Sealants".
   2. Division 09 painting Sections for paints and coatings.

1.3 SUBMITTALS

A. Product Data: For each coating system indicated. Include primers and undercoats.

   1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
   2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing and applying each material specified.

B. Certification by manufacturer that products supplied comply with requirements indicated that limit the amount of VOCs in coating products.

C. Warranty: Special warranty specified in this Section

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed anti-graffiti coating system applications similar in material and extent to those indicated for Project and whose work has a record of successful in-service performance.

B. Source Limitations: Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with the following information:

1. Name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for vehicle constituents.
5. Thinning instructions
6. Application instructions
7. Handling instructions and precautions.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a temperature range between 40 and 95 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing and applying coatings.

1.6 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 45 and 85 deg F.

B. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit coatings to be applied according to manufacturers' written instructions and warranty requirements:

1. Concrete surfaces and mortar have cured for more than 28 days.
2. Rain or snow is not predicated within 24 hours.
3. Application proceeds more than 24 hours after surfaces have been wet, unless otherwise recommended by manufacturer.
4. Windy conditions do not exist that may cause anti-graffiti coatings to be blown onto vegetation or surfaces not intended to be treated.

C. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with a continuing coating operation.
2. Work may continue during inclement weather only if areas and surfaces to be coated are enclosed and temperature within the area can be maintained within limits specified by manufacturer during application and drying periods.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and applicator agree(s) to repair or replace materials that fail to maintain graffiti repellency within specified warranty period.

1. Warranty Period: Provide manufacturers 2 Year Graffiti Protection Warranty

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: To coordinate with City of Sparks existing building maintenance operations, provide the following:
   1. Evonik Industries-Protectosil CHEM-TRETE PB VOC (High performance, penetrating water repellent)
   2. Bithell Inc. VITROCEM ANTI-GRAFFITTI GLAZED COATING SYSTEM

2.2 COATINGS MATERIALS, GENERAL

A. Material Compatibility: Provide primers, undercoats, and finish-coat materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's highest grade of the various anti-graffiti coatings specified. Materials not displaying manufacturer's product identification are not acceptable.

   1. Proprietary Names: Use of manufacturer's proprietary product names to designate materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. VOC Classification: Provide anti-graffiti coating materials, that have a VOC classification of 450 g/L or less.

2.3 EXTERIOR ANTI-GRAFFITI COATING SYSTEMS

A. Provide the following coating system over exterior split-faced concrete masonry vertical surfaces:

   1. First Product: Evonik Industries Protectosil CHEM-TRETE PB VOC Water Repellent – 1 flood coat per manufacturer’s installation instructions.

   2. Second Product: Bithell, Inc.,VITROCEM Clear Polyester by spray or roller. Rate will vary depending on surface porosity, completely fill all surface voids. After first coat has cured, provide second coat – final surface appearance shall be free of surface voids and pinholes.

   3. Third Product: Bithell, Inc.,VITROCEM Clear Glaze by spray.

PART 3 - EXECUTION

3.1 EXAMINATION

A. With Applicator present, examine substrates and conditions under which anti-graffiti coatings will be applied, for compliance with coating application requirements.

   1. Apply coatings only after unsatisfactory conditions have been corrected and surfaces to receive coatings are thoroughly dry.
   2. Start of application is construed as Applicator's acceptance of surfaces within that particular area.

B. Coordination of Work: Review other Sections in which primers or other coatings are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of specified finish materials to ensure compatible primers.

3.2 PREPARATION

A. General: Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.

1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.

B. Cleaning: Before applying anti-graffiti coatings, clean substrates of substances that could impair bond of coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and coating application so dust and other contaminates from cleaning process will not fail on wet, newly coated surfaces.

C. Surface Preparation: Clean and prepare surfaces to be treated according to manufacturer's written instructions for each substrate condition and as specified.

1. Prepare concrete masonry block, surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.

a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
b. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

D. Material Preparation: Use material as furnished by Manufacturer in labeled and batch numbered. DO NOT DILUTE. Vitrocem Coatings require the addition of catalyst just prior to use. Atmospheric conditions affect the curing. Follow Manufacturer’s printed directions regarding catalyst concentrations at varying temperatures.

E. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of coating system components. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of components being deposited on surfaces. Cover live plants and grass.

F. Coordination with Sealants: Do not apply anti-graffiti coatings until sealants for joints adjacent to surfaces receiving coatings have been installed and cured.

1. Anti-graffiti coating work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, anti-graffiti coatings, and sealant materials identical to those used in the work.

G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 APPLICATION

A. Manufacturer's Field Service: Engage a factory-authorized service representative to instruct Applicator on the product and application method to be used.

B. General: Apply anti-graffiti coatings according to manufacturer's written instructions.

1. Use applicators and techniques best suited for the material being applied.
2. Do not apply anti-graffiti coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
3. Coating surface treatments and finishes are indicated in the coating system descriptions.
4. Provide finish coats compatible with primers used.
5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convectors covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

3.4 CLEANING

A. Immediately clean anti-graffiti coatings from adjoining surfaces and surfaces soiled or damaged by application as work progresses. Repair damage caused by application. Comply with manufacturer's written cleaning instructions.

3.5 PROTECTION

A. Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

1. Provide "Wet Paint" signs to protect newly coated finished. After completing coating operations, remove temporary protective wrappings provided by others to protect their work.

END OF SECTION 09 96 00

SECTION 10 14 23 – BUILDING SIGNAGE

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
1. Exterior Identification Signage.

1.2 REGULATORY REQUIREMENTS

A. ADAAG - Americans with Disabilities Act Accessibility Guidelines; Federal Register with most current adopted sections.

B. CABO/ANSI A117.1 - Accessible and Usable Buildings and Facilities; American National Standards Institute, Inc.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations for each major product required. Include data substantiating that products to be furnished comply with requirements of the contract documents.

B. Provide the required copies of:
1. Product data sheets.
2. Installation instructions.

C. Verification Samples: To verify compliance with requirements of contract documents, submit one sample of each item selected.

D. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include plans, elevations and sections as required. Show accessories and installation details.
1. Provide a schedule of all signage text, Braille and pictograms (where applicable) accompanied by a full-size elevation of sign.

E. Maintenance Data: Submit manufacturer's instructions for proper maintenance materials and procedures.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain required products from a single manufacturer.

B. Provide signage that complies with CABO/ANSI A117.1 and ADAAG standards.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Kroy Sign Systems LLC
b. ASI Sign Systems, Inc.
c. Best Manufacturing Co.

d. Vomar Products, Inc.

B. Sign Materials:
1. Cast acrylic sheet: Provide cast (not extruded or continuous cast) methyl methacrylate monomer plastic sheet with a minimum flexural strength of 16,000 psi when tested in accordance with ASTM D 790, a minimum allowable continuous service temperature of 176 degrees F (80 degrees C).

D. Exterior Signs:
1. Unframed signs:
   a. Acrylic face sheet thickness: 1/8 inch thick.
   b. Edge condition: Square cut.
   c. Corner Condition: Square cut.
   d. Raised Copy: Machine-cut copy characters from matte-finish opaque acrylic sheet and chemically weld onto the acrylic sheet forming the sign face.
      1. Copy character thickness: 1/32 inch.
   e. Engraved Copy: Engraved copy shall be produced into acrylic face sheet in precisely formed characters.
      1. Grade 2 Braille shall be included in all applicable signs.
   f. Sign shall be sized to adequately display text noted for each sign. Minimum size: 6 inches x 6 inches.
   g. Font: Gill Sans MT

E. Colors: Colors of face sheets and raised copy shall be as selected by the Architect from the standard colors after the award of the contract.

F. Mounting: Attach signs to wall surfaces as follows:
1. Projected Mounting: W/ tamper proof headed screw into CMU

2.2 SIGNAGE SCHEDULE

A. Signage schedule is included at the end of this Section.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect substrates and conditions under which the work of this section will be performed, and verify that installation properly may commence. Do not proceed with the work until unsatisfactory conditions have been resolved fully.

3.2 INSTALLATION

A. General: Comply with manufacturer's instructions, except where more stringent requirements are shown or specified, and except where project conditions require extra precautions or provisions to ensure satisfactory performance of the work.

B. Mount in accordance with referenced regulatory requirements.

3.3 CLEANING

A. Upon completion, clean all surfaces that have become soiled or coated as a result of work of this section, using proper methods that will not scratch or otherwise damage finished surfaces.

B. Remove all traces of protective coatings or paper.

C. Clean all exposed surfaces after installation.

3.4 PROTECTION

A. General: Institute protective procedures and install protective materials as required to ensure that work of this section will be without damage or deterioration at substantial completion.

Signage Schedule

Door #	Location	Text 1st line	Text 2nd line	Sign Type	Pictogram A	Pictogram B
101	Exterior	Storage		B		
103	Exterior	Men's		A	ISA	Man
104	Exterior	Janitor		A		
105	Exterior	Women's		A	ISA	Woman

Should the actual layout allow for different dimensions, Contractor may propose different configurations provided the text requirements are met. Should the sizes be revised all signs will be required to have a constant width or height dimension for all signs.

All text is 1/32 inch high by 5/8 inch tall with associated Braille as required.

Text Notes:

1. "ISA" refers to the International Symbol of Accessibility.

END OF SECTION 101423

SECTION 102113 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid-polymer toilet compartments configured as toilet enclosures and urinal screens.

B. Related Sections:

1. Section 061000 "Rough Carpentry" for blocking, overhead support of floor-and-ceiling-anchored compartments, and overhead support of post-to-ceiling screens.
2. Section 102800 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.
1. Show locations of centerlines of toilet fixtures.
2. Show overhead support or bracing locations.

C. Samples for Initial Selection: For each type of unit indicated. Include Samples of hardware and accessories involving material and color selection.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Comply with requirements in GSA's CID-A-A-60003, "Partitions, Toilets, Complete."

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 75 or less.
2. Smoke-Developed Index: 450 or less.

C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1 for toilet compartments designated as accessible.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M.

B. Aluminum Extrusions: ASTM B 221 .

C. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

D. Stainless-Steel Castings: ASTM A 743/A 743M.

2.2 SOLID-POLYMER UNITS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Accurate Partions Corporation
2. Ampco
3. General Partitions Mfg. Corp.
4. Global Steel Products Corp.
5. Santana Products, Inc.

B. Toilet-Enclosure Style: Floor and ceiling anchored.

C. Door, and Pilaster Construction: Solid, high-density polyethylene (HDPE) or polypropylene (PP) panel material, not less than 1 inch thick, seamless, with eased edges, no-sightline system, and with homogenous color and pattern throughout thickness of material.
1. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range.

D. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.

E. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

2.3 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.

1. Material: Stainless steel.
2. Hinges: Manufacturer's standard continuous, cam type that swings to a closed or partially open position.
3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.

B. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.4 FABRICATION

A. Floor-and-Ceiling-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.

B. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, in-swinging doors for standard toilet compartments and 36-inch-wide, out-swinging doors with a minimum 32-inch-wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:

a. Pilasters and Panels: 1/2 inch .
b. Panels and Walls: 1 inch .

B. Floor-and-Ceiling-Anchored Units: Secure pilasters to supporting construction and level, plumb, and tighten. Hang doors and adjust so doors are level and aligned with panels when doors are in closed position.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and doors in entrance screens to return doors to fully closed position.

END OF SECTION 102113

SECTION 102800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Warm-air dryers.
3. Custodial accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Manufacturer's warranty.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements,

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Bobrick
2. American Specialties, Inc.

C. Grab Bars F/M/U:

1. Basis-of-Design Product: Bobrick Toilet Compartment Bar:.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.

a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.

4. Outside Diameter: 1-1/2 inches .
5. Configuration and Length: Straight, 36 inches long (F); 42 inches long (M); 18 inches long (U).

D. Sanitary-Napkin Disposal Unit J:

1. Basis-of-Design Product: Bobrick B-270 Contura Series.
2. Mounting: Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless steel, No. 4 finish (satin).

2.3 WARM-AIR DRYERS

A. Warm-Air Dryer A:

1. Basis-of-Design Product: Dyson Airblade V Hand Dryer.
2. Mounting: Surface mounted.
3. Operation: Electronic-sensor activated with timed power cut-off switch.

a. Operation Time: 30 to 40 seconds.

4. Cover Material and Finish: Molded plastic, gray.
5. Electrical Requirements: 110-127 V, 15A, 1400 W.

2.4 CUSTODIAL ACCESSORIES

A. Mop and Broom Holder L:

1. Basis-of-Design Product: Bobrick B-239.
2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 34 inches.
4. Hooks: Four.
5. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, No.4 finish (satin).

2.5 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf , when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:

a. Portable fire extinguishers.

B. Related Requirements:

1. Section 104416 "Fire Extinguishers."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

1.4 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 FIRE-PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.

B. Cabinet Construction: Nonrated.

C. Cabinet Material: Cold-rolled steel sheet.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on wall with no trim.

E. Door Material: Steel sheet.

F. Door Style: Vertical duo panel with frame.

G. Door Glazing: Tempered float glass (clear).

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide projecting lever handle with cam-action latch.
2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

I. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.

a. Identify fire extinguisher in fire-protection cabinet with the words " FIRE EXTINGUISHER."

1) Location: Applied to cabinet door.
2) Application Process: Pressure-sensitive vinyl letters.
3) Lettering Color: Red.
4) Orientation: Vertical.

J. Materials:

1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

a. Finish: Baked enamel or powder coat.
b. Color: As selected by Architect from full range of industry colors and color densities.

2. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Provide factory-drilled mounting holes.
3. Prepare doors and frames to receive locks.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.3 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

1. Fire-Protection Cabinets: 54 inches above finished floor to top of cabinet.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification: Apply vinyl lettering at locations indicated.

3.3 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes portable fire extinguishers.

B. Related Sections:

1. Division 10 Section "Fire Extinguisher Cabinets."

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.

B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function.

C. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

D. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FMG.

1.5 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Basis of design: Larsen's Manufacturing Company.(Model # MP10)
b. J. L. Industries, Inc.; a division of Activar Construction Products Group.
c. Potter Roemer LLC.

2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging

B. Multipurpose Dry-Chemical Type: UL-rated 10 lbs nominal capacity, with mono-ammonium phosphate-based dry chemical in manufacturer's standard enameled container.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION 104416

SECTION 22 00 00 – PLUMBING

PART 1 GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. This section is a general requirements Plumbing section and is a part of each Plumbing section making reference to Plumbing related work.

B. For convenience or reference the Specifications are separated into Divisions and Sections. Such separations shall not operate to make the Engineer an arbitrator to establish subcontract limits between the Prime Contractor and his Subcontractors. In any case, the Prime Contractor is responsible to the owner for a complete job.

1.2 WORK INCLUDED:

A. This section consists of General Requirements and Standard Specifications covering certain parts of Plumbing work and is supplemented by other Division 22 specification sections covering additional work, requirements, and materials specifically applicable to the Plumbing work of each section. Requirements of subsequent sections of the specifications, if in conflict with these General Requirements, shall govern.

1.3 REQUIREMENTS OF REGULATORY AGENCIES:

A. Provide work and materials in full accordance with the latest rules and regulations of the following:

IBC 2006 - International Building Code.
UMC 2006 - Uniform Mechanical Code.
UPC 2006 - Uniform Plumbing Code.
Nevada State Regulatory Agencies.
Utility Company Regulations.

B. Office of Statewide Health, Planning and Development

C. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes.

D. Conform to State of Nevada Energy Conservation Standards for all systems, equipment, and construction.

E. Conform to State of California Energy Conservation Standards for all systems, equipment, and construction.

F. When Contract Documents differ from governing codes, furnish and install larger size or higher standards called for without extra charge.

G. No material installed as part of this WORK shall contain asbestos in any form.

1.4 FEES, PERMITS, AND UTILITY SERVICES:

A. Obtain and pay for all permits and service required in installation of this work; arrange for required inspections and secure approvals from authorities having jurisdiction.

B. Arrange for utility connections and pay charges incurred, including excess service charges, if any.

1.5 SITE EXAMINATION:

A. Examine site, verify dimensions and locations against Drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.

B. Information shown relative to existing services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation for new piping or its installation.

C. Exercise extreme care in excavating near existing utilities to avoid any damage thereto. This Contractor is responsible for any damage caused by his operations.

1.6 MATERIAL LIST AND SUBSTITUTIONS:

A. Prior to commencement of work, and within 35 days after award of Contract, submit to Architect for review seven copies of a complete list of equipment and materials to be furnished, including all substitutions. Substitutions will be interpreted to be all manufacturers other than those specifically listed by model or catalog number.

B. Partial or incomplete lists of material will not be considered.

C. Only one request for substitution will be considered on each item of material or equipment. No substitutions will be considered thereafter.

D. Quantities are the Contractor's responsibility and will not be reviewed.

E. If Contractor desires to make a substitution, he shall submit complete information or catalog data to show equality of equipment or material offered to that specified. No substitutions will be allowed unless requested and reviewed in writing. The Architect shall review and take appropriate action on shop Drawings, product data, samples, and other submittals required by the Contract Documents. Such review shall be only for general conformance with the design concept and general compliance with the information given in the Contract Documents. It shall not include review of quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with the work of other trades, or construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate acceptance of an assembly of which the item is a component. The Architect shall not be required to review and shall not be responsible for any deviations from the Contract Documents not clearly noted by the Contractor, nor shall the Architect be required to review partial submissions or those for which submissions for correlated items have not been received. Architect reserves right to require originally specified item.

F. Installation of reviewed substitution is Contractor's responsibility. Any changes required for installation of reviewed substituted equipment must be made without additional cost. Review by the Architect of the substituted equipment and/or dimensional Drawings does not waive these requirements.

G. Submit to Architect for review, within reasonable time after award of Contract and in ample time to avoid delay of construction, shop Drawings or submittals on all items of equipment and materials covered in list mentioned above. Provide submittals in seven (7) copies and in a complete package. Partial submittals will not be considered.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Provide factory-fabricated piping specialties and valves recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined by Contractor to comply with installation requirements. Provide sizes and connections which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Contractor's option.

B. Unless otherwise indicated, provide valves of same size as upstream pipe size.

2.2 MATERIALS AND EQUIPMENT:

A. Mention herein or on Drawings requires that this Contractor provide each item listed of quality noted or equal. All material shall be new, full weight, standard in all respects, and in first-class condition. Provide materials of the same brand or manufacture throughout for each class of material or equipment wherever possible. Materials shall be tested within the Continental United States by independent, nationally recognized testing agency and shall be listed in accordance with testing agency requirements.

B. The grade or quality of materials desired is indicated by the trade names or catalog numbers stated herein.

C. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permission of the Architect.

D. Conform to the State Energy Conservation Standards for all material and equipment.

2.3 MATERIALS FURNISHED:

A. Identify all materials and equipment by manufacturer's name and model number. Remove unidentified materials and equipment from site.

B. Equipment specified by manufacturer's number shall include all accessories, controls, etc. listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.

C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new equipment. Variance from this permitted only with written consent of the Architect.

PART 3 EXECUTION

3.1 ACCESS TO PLUMBING WORK:

A. Comply with manufacturer's instructions for installation of access doors.

B. Access panels shall be furnished and installed wherever valves, balance valves, damper operating mechanisms, air terminal boxes, fans, and similar items normally requiring adjustment or servicing are installed in concealed or inaccessible spaces. Coordinate with access doors shown on architectural Drawings.

3.2 DRAWINGS AND COORDINATION:

A. General arrangement and location of piping, ductwork, equipment, etc. are shown on Drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work.

B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid conflict therewith. This shall not be cause for additional cost.

3.3 ACCESS:

A. Continuously check Architectural Drawings for clearance and accessibility of equipment specified herein to be placed. No allowance of any kind will be made for negligence on part of Contractor to foresee means of installing his equipment into proper position.

3.4 CLOSING IN OF UNINSPECTED WORK:

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested, uncover work at own expense. After it has been inspected and tested, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.5 PROJECT MODIFICATIONS:

A. During the progress of construction, if such conditions arise that require revisions, modifications, or relocations to any mechanical equipment or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review by the Architect prior to actual revision work in the field.

B. Two sets of Drawings showing all revisions shall be immediately presented to Architect for his records. Maintain additional copies on the project as necessary to comply with "RECORD DRAWINGS" requirement of the General Requirements.

C. Incorporate all revisions into record Drawings.

3.6 FORMING, CUTTING AND PATCHING:

A. Coordinate with other contractors as necessary to provide any special forming, recesses, chases, etc., and provide wood blocking, backing, and grounds as necessary for proper installation of mechanical work.

B. If this Contractor fails to coordinate with other contractors at proper time or fails to locate items properly, resulting in extra work, then this Contractor is responsible.

C. This Contractor is responsible for proper placement of pipe sleeves, hangers, inserts, and supports for work.

D. Cutting, patching, and repairing of existing (old) construction to permit installation of piping, etc. is responsibility of this Contractor. Repair or replace damage to existing work with skilled mechanics for each trade involved in first-class manner.

3.7 STRUCTURAL DESIGN OF EQUIPMENT AND SEISMIC RESTRAINTS:

A. All mechanical equipment supports shall be designed by a licensed Structural Engineer and shall comply with the Uniform Building Code seismic requirements as well as requirements for direct bearing loads.

B. Provide all piping and ductwork with seismic restraints using seismic hazard level (SHL) "A" as called for in SMACNA's Seismic Restraint Manual Second Edition 1998.

C. In addition, conform to all State of Nevada requirements.

3.8 GUARANTEE:

A. Be responsible for work done and material installed under these plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show itself within one year of filing of Notice of Completion and be responsible for damage to other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to Owner.

B. Be responsible for damage to any part of premises during guarantee period caused by leaks or breaks in work furnished and/or installed under this section.

3.9 RECORD DRAWINGS:

A. Upon completion of work covered by this Contract, furnish Architect with record drawings, showing all changes of piping, ductwork, etc. within building and installed under this Contract which are not in accord with these Drawings for the work. Record drawing deliverables to consist of the following:

1. Provide 1 complete set of full size drawings on 20 pound white bond paper.

2. Provide 1 CD (compact disc) with Record drawings in either AutoCAD (Latest Version) or PDF format.

3. Record drawings are to be full size drawings (same size as Contract Documents) and all plans are to be to standard engineering scale. The minimum drawing scale to match those provided within the Contract Documents.

4. Record Drawings to include all outside utility connections, piping, etc. installed under this Contract. Locate and dimension all work with reference to permanent landmarks

B. Match all symbols and designations used in Contract Drawings when preparing "Record" Drawings.

C. Indicate clearly and correctly all work installed differently from that shown, and maintain records up to date as work progresses. Include invert elevations of pipes below grade of floor, the floor lines, plugged wyes, tees, caps, exact locations and sizing of piping, location of valves, and the like. Dimension locations from structural points.

D. Properly identify all stubs for future connections as to locations and use by setting of concrete marker at finished grade in manner suitable to Architect.

3.10 PROJECT COMPLETION TESTS AND START-UP:

A. Upon completion of the mechanical work, or at such time prior to completion as may be determined by the Architect, operate and test all mechanical equipment and systems for a period of at least five consecutive 8-hour days to demonstrate the satisfactory overall operation of the building or project as a complete unit.

B. Provide training and orientation of Owners operating staff in proper care and operation of equipment, systems and controls.

C. During test period, make final adjustments and balancing of equipment so that all are placed in first-class operating condition.

D. Mark final positions of balancing valves after balancing is complete.

E. Final observation will not be made until all of the above have been completed and balance report has been submitted and reviewed.

3.11 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 22 01 00 - OPERATION AND MAINTENANCE OF PLUMBING

PART 1 GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. This section is a Section 22 Basic Materials and Methods section and is a part of each Section 22 section making reference to mechanical insulation specified herein.

C. For convenience or reference the Specifications are separated into Divisions and Sections. Such separations shall not operate to make the Engineer an arbitrator to establish subcontract limits between the Prime Contractor and his Subcontractors. In any case, the Prime Contractor is responsible to the owner for a complete job.

1.2 WORK INCLUDED:

A. This section consists of General Requirements and Standard Specifications covering certain parts of the Plumbing work and is supplemented by other Specification sections covering additional work, requirements, and materials specifically applicable to the work of each section. Requirements of subsequent sections of the specifications, if in conflict with these Requirements, shall govern.

1.3 MAINTENANCE AND OPERATING INSTRUCTIONS:

A. Furnish Architect with two complete sets of typewritten operating and maintenance instructions, descriptive literature, catalog cuts, and diagrams covering all items of operation and maintenance for each and every mechanical system and piece of equipment furnished under these specifications.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

3.1 WINTERIZATION

A. The building's plumbing systems shall be constructed in such a manner to allow for the owner to winterize the system on annual basis. This contractor shall be responsible for developing and documenting these winterization measures. Submit a copy of the winterization procedure to the owner for his/her review prior to construction. Upon approval, the procedure shall be placed in the operating and maintenance binders referenced above. This contractor shall be responsible to train the owner's technical representative on the procedures to be utilized in the winterization process.

END OF SECTION

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. This section is a Common Work Results for Plumbing and is a part of each Plumbing section making reference to Plumbing related work, valves, and piping specialties specified herein.

B. This section is a Section 22 Basic Materials and Methods section and is a part of each Section 22 section making reference to mechanical insulation specified herein.

1.2 WORK INCLUDED:

A. Types of Plumbing related work specified in this section include the following:

Access Doors
Roof and Wall Flashing
Pipe and Equipment Identification
Gauges
Excavating and Backfill

B. Types of piping specialties specified in this section include the following:

Pipe Escutcheons
Sleeves
Sleeve Seals

C. Types of valves specified in this section include the following:

Ball Valves
Drain Valves

1.3 PROJECT CONDITIONS:

A. Existing Utilities: Locate and protect existing utilities and other underground work in manner which will ensure that no damage or service interruption will result from excavating and backfilling.

1.4 QUALITY ASSURANCE:

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of piping specialties and valves, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Valve Types: Provide valves of same type by same manufacturer.

C. Identification: Provide piping specialties and valves with manufacturer's name (or trademark) and pressure rating clearly marked on valve body.

1.5 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of manufactured piping specialty and valve.

1. Include pressure drop curve or chart for each type and size of valve, control valve and balancing valve.

B. Maintenance Data: Submit maintenance data and spare parts lists for each type of manufactured piping specialty and valve. Include this data and product data in maintenance manual in accordance with requirements of Division 1.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Provide factory-fabricated piping specialties and valves recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined by Contractor to comply with installation requirements. Provide sizes and connections which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Contractor's option.

B. Unless otherwise indicated, provide valves of same size as upstream pipe size.

2.2 ACCESS DOORS:

A. Where floors, walls, or ceilings must be penetrated for access to Plumbing equipment, provide access doors, 14-inch by 14-inch minimum size in usable opening. Where entrance of a serviceman may be required, provide 18-inch by 24-inch minimum usable opening.

B. Access doors shall match those supplied in Division 8 in all respects, except as noted herein.

C. Where specific information or details relating to access panels different from the above is shown or given on the Drawings or other Divisions of work, then that information shall supersede this specification.

D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering access doors which may be incorporated in the work include the following:

Milcor Style K (plaster)
Style A (A/C tile, gypsum board)
Style M (Masonry)
Style "Fire Rated" where required.

2.3 FLASHINGS MEMBRANE TYPE ROOFING:

A. Flashing for penetrations of the roof for Plumbing items such as flues, ducts, and pipes will be furnished and installed under other sections of these specifications. The work of this section shall include layout, sizing, and coordination of penetrations required for the Plumbing work.

1. Furnish and install counterflashings above each flashing required in the Plumbing work. Flues and ducts shall have 24-gauge galvanized sheet metal storm collar securely clamped to the flue or duct above the flashing.

2. Sewer vents and other piping extending through roof structure shall have flashing provided and installed as part of the roofing work. This contractor shall coordinate his Work accordingly.

B. Sewer vents and other piping extending through roof structure shall have Semco, Smith, or equal to Semco #1100- 4, counterflashing sleeves installed.

2.4 GAUGES:

A. Gauges and gauge connections shall be furnished at all locations shown on the Drawings and in accordance with these specifications, whether shown on the Drawings or not.

B. Gauges shall be of high quality, Marsh Quality, or equal with accuracy to be within 1 percent in the middle third of the dial range and equipped with front calibration. Gauge movements shall be phosphor bronze, bushed, rotary type. Gauges mounted on panel boards shall be the flush-mounting type in cast-iron or aluminum cases. Stem or pipe mounted gauges shall have flangeless cases of drawn or stamped steel, phenolic, or aluminum. Gauges shall have a minimum dial size of 3-1/2 inches.

2.5 PIPING AND EQUIPMENT IDENTIFICATION:

A. Each piping system furnished and installed under this work shall be identified and the direction of flow indicated by means of colored stenciled legends and flow arrows, all as specified herein. The markings shall be applied after all painting, priming, and cleaning of the piping and insulation is completed.

B. In lieu of the colored stenciling, prefabricated coiled plastic labels may be used, as manufactured by Marking Services Incorporated (MSI), or equal. Labels shall comply with ASME A13.1 with regard to color, letter height, and marker size. The labels shall have black or white lettering and flow arrows on colored backgrounds and shall not require adhesive. The background colors shall conform to the color schedule shown in this Article.

a. For use indoors use 20 mil vinyl labels, MSI model MS-970, or equal. For piping with an outside diameter, including insulation, greater than 6 inches provide the label manufacturers nylon straps to secure label to piping. Labels shall lay smoothly against pipe or insulation completely around the pipe, provide nylon straps if required.

b. For use outdoors use Polyester/Tedlar laminated material, MSI model MS-977, or equal. For piping with outside diameter, including insulation, greater than 6 inches provide the label manufacturers stainless steel straps to secure label to piping. Labels shall lay smoothly against pipe or insulation completely around the pipe, provide nylon straps if required.

C. The size of the lettering and label shall be such that the lettering can be easily read from the floor and the colors easily discernible.

D. Available Manufacturers: Subject to compliance with requirements, manufacturers which may be incorporated in the work include the following:

Marking Services Incorporated, (MSI)
LEM Products
Seton
Craftmark

2.6 PIPE ESCUTCHEONS:

A. Provide chrome plated brass pipe escutcheons with inside diameter closely fitting pipe outside diameter or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, ceilings, or pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish and screw or spring clamping device with concealed hinge.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering pipe escutcheons which may be incorporated in the work include the following:

Chicago Specialty Manufacturing Company
Producers Specialty and Manufacturing Corporation
Sanitary-Dash Manufacturing Company

2.7 PIPE SLEEVES:

A. Where pipes pass through concrete floors or walls, install galvanized metal or plastic sleeves having not less than 1/2-inch or more than 1-inch clearance around sides of the pipe or pipe covering for the full thickness of the concrete.

1. After piping has been installed, fill annular space with fireproof safeing.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering pipe sleeves which may be incorporated in the work include the following:

Adjustocrete
Sperzel "Crete-Sleeve"

2.8 SLEEVE SEALS:

A. Provide sleeve seals for sleeves located in foundation walls below grade or in exterior walls as follows:

1. Foundations: Lead and oakum, caulked between sleeve opening and pipe.

2. Walls Below Grade: Modular-mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

3. Available Manufacturers: Subject to compliance with requirement, manufacturers offering mechanical sleeve seals which may be incorporated in the work include the following:

Link-Seal Corporation - Thunderline Corporation
Calpico Inc.

PART 3 EXECUTION

3.1 ACCESS TO PLUMBING WORK:

A. Comply with manufacturer's instructions for installation of access doors.

B. Access panels shall be furnished and installed wherever valves, balance valves, damper operating mechanisms, air terminal boxes, fans, and similar items normally requiring adjustment or servicing are installed in concealed or inaccessible spaces. Coordinate with access doors shown on architectural Drawings.

C. Where access panels are detailed on architectural or mechanical Drawings, sizes indicated thereon shall be used.

D. Where access panels are to be located in acoustic tile ceilings, the size of the access panel required shall be increased to properly fit the tile pattern without cutting into the tile.

3.2 EXCAVATING AND BACKFILL:

A. Do excavating required for installation of piping and service lines and other work that applies as indicated on Drawings. Verify location and elevation of all existing utilities prior to excavation for installation of new piping.

B. Excavations shall be of open vertical construction of sufficient width to provide free working space at both sides of trench and around pipe as required for caulking, joining, backfilling, and compacting. Where invert elevations are not shown, dig trenches to sufficient depth to give minimum of 2 foot, 6 inches of fill above top of exterior piping, measured from adjoining finished grade, except as follows:

Outside water lines - 36 inches minimum cover.
Gas lines - 2 feet, 6 inch minimum cover.

C. Dig trenches straight and true to line and grade with holes for bells for bell-and-spigot pipe. Evenly support piping for its entire length upon outside periphery of lower one-third of pipe. Where rock is encountered, undercut trenches 3 inches and fill with well-tamped, clean sand and pea gravel to correct pipe elevation.

D. After pipelines in excavation have been installed and tested, backfill excavation to point 6 inches above pipe using sand, fine earth, or other materials free of rocks and large lumps. Proceed evenly on both sides of pipe and continuously tamp. Except as hereinafter noted, backfill above 6 inches above top of pipe shall be made by using earth from excavation placed in layers of 8-inch maximum depth. Compaction of each successive layer will be made with mechanical compactor.

E. Take special care in backfilling over wrapped piping to prevent damage to protective wrapping.

F. Bed sewers under pavements and wrapped piping in sand prior to backfilling. Backfill to point 6 inches above pipe with sand.

G. When pipe or underground conduit with a protective wrapping is to be placed in the trench, sand only shall be used for bedding the pipe or conduit. The sand used shall be certified to have a minimum resistance of 5000 ohms per cubic centimeter when wetted to any moisture content with distilled water and shall consist of clean, natural, washed-sand, hard, and durable particles varying from fine particles to particles of such size that all will pass through a 3/8-inch screen, not less than 90 percent will pass through a 1/4-inch screen, and not more than 25 percent will pass through a No. 50 screen.

H. Any backfill placed under this contract which subsides or settles below the adjacent finished grade or paving level during the guarantee period shall be brought to grade by the Contractor by adding compacted backfill or additional paving in paved areas.

3.3 PAINTING:

A. This Contractor shall provide one coat of primer paint and one coat of finish enamel paint to match that used in the General Work on all ferrous piping, all stands, and all hangers. Coordinate painting with General Contractor.

3.4 CONCRETE WORK:

A. Except as noted above, concrete work shall be furnished and installed under General Work. This Contractor shall coordinate requirements accordingly.

3.5 INSTALLATION OF GAUGES:

A. Gauges shall have indication of 0 to 160 psi where indicated pressure will be greater than 40 PSI and 0 to 60 psi for lesser pressures.

B. Provide gauge connections at the following locations:

Inlet and outlet of butterfly-type balancing valves
Suction and discharge of circulating pumps
Elsewhere as may be shown on the Drawings

C. Gauges shall be provided in a convenient location within approximately 5 feet of the flanges or connections and elsewhere as may be shown on the Drawings.

D. Gauge Cocks and Siphons:

1. A needle-point globe valve, similar to Crane No. 88, shall be supplied at each gauge and gauge connection.

a. A gauge siphon located adjacent to the gauge shall be applied with each hot water gauge.

3.6 PIPE IDENTIFICATION:

A. Identification shall be applied to all piping, except piping located in furred spaces without access to permit entrance of personnel, and piping buried in the ground or concrete.

B. The legend and flow arrow shall be applied at all valve locations, at all points where piping enters or leaves a wall, partition, cluster of piping, or similar obstruction, and at approximately 20-foot intervals on pipe runs.

C. Practical variations or changes in locations and spacing may be made with the specific approval of the Architect to meet specific conditions.

D. Wherever two or more pipes run parallel, the printed legend and other markings shall be applied in the same relative location so that all piping is easily identified.

E. The marking shall be located so as to be readily conspicuous at all times from any reasonable point of vantage.

F. The legends and flow arrows shall be in the colors as indicated in the pipe marking schedule.

G. The paint shall be prepared enamel brushed on or sprayed from pressurized cans.

H. Where the pipe marking colors are not easily visible over the background, such as brown on soil pipe, orange on copper pipe, or similar combinations, a neat white or aluminum-colored background shall be painted on the pipe before the markings are applied.

I. The sizes, in inches, of the stenciled lettering and flow arrows shall be as follows:

Outside Dia., in Inches of Covering	Size of Stencil Letter	Minimum Length of Flow Arrow
5/8” to 2"	1/2"	3”
2-1/2" to 4”	1"	4”
4"to 7"	2"	5"
Greater than 7”	3"	6"

J. Where different equipment, such as fire sprinklers, are supplied from a common main, such as domestic water, the main should be identified as "Domestic Water" and each respective branch takeoff as "Fire Water," etc.

Pipe Marking Schedule:

Legend	Color
Domestic Water	Green
Hot Water - Domestic Supply	Yellow
Sanitary Sewer	Brown
Plumbing Vent	Brown

3.7 ELECTRICAL WORK:

A. Adequate working space shall be provided around electrical equipment in compliance with the National Electric Code and other applicable codes or ordinances. The Plumbing work shall be coordinated with the Electrical Work in order to comply with these requirements. Any work which does not conform to these regulations shall be properly corrected without additional cost to the Owner.

B. Furnish and install all line voltage and low-voltage temperature control wiring in the Plumbing Work by the Temperature Control SubContractor, including all interlock wiring between motor starter coils, interlock relays, and temperature control equipment. Unless noted otherwise, this does not include primary control wiring between starters and push button or other manual starter switch or branch power circuits required for temperature control systems.

1. Starters located in motor control centers will be provided under the Electrical Work. Contractor is referred to electrical drawings for motors served by motor control centers.

2. Motors furnished in the Plumbing Work shall be furnished by the Plumbing Contractor, but such equipment shall be delivered to the Electrical Contractor for mounting and connecting to power wiring. Coordinate all motor starter requirements with Electrical Contractor.

3. Temperature control equipment, including relays shown on control diagram, shall be furnished and installed by the Temperature Control Subcontractor.

4. Electrical devices with piping connections, such as solenoid valves, insertion thermostats, strap-on aquastats, and similar items which are to be wired under the Electrical Work or by the Temperature Control Subcontractor, shall be installed by the Plumbing Contractor.

C. Equipment furnished in this work that is factory wired but requires modification to internal wiring to meet specifications or drawing requirements shall have such internal modifications made at factory before shipment.

D. All electrical work and equipment, including internal wiring, must comply with applicable codes and applicable portions of electrical specifications. Run line and low-voltage control wiring in conduit. Conduit for temperature control wiring shall be responsibility of Plumbing Contractor and shall be of type specified in electrical specifications.

3.8 FLASHINGS:

A. Provide pipe flashings as noted on the Drawings.

B. Flue and duct flashings and storm collars shall be securely clamped around flue or duct storm collar or counterflashing, above flashing.

3.9 INSTALLATION OF PIPING SPECIALTIES:

A. Pipe Escutcheons: Install pipe escutcheons on each pipe penetration through floors, walls, partitions, and ceilings where penetration is exposed to view and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole and is flush with adjoining surface.

B. Sleeves: Secure sleeves to metal or wood forms in such a manner that they will not become displaced during pouring of concrete. Fill sleeves on deck with sand. After forms have been removed from concrete, the sleeves shall be removed from the openings.

C. Core drill properly sized holes in the concrete to replace metal sleeves that are crushed or knocked out of position during pouring of concrete.

D. Provide piping passing through concrete fire walls with sleeves of standard black steel pipe nominally one size larger than pipe enclosed, but in the case of insulated pipe, large enough for insulation to pass through. Caulk space between pipe and sleeve with fire-rated wicking, and provide metal retainer plates at both sides of the wall.

3.10 INSTALLATION OF VALVES:

A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane.

C. Provide union at each connection to equipment and downstream of each valve. Provide unions at both ends of valves when valves can not be turned due to an obstruction.

D. After piping systems have been tested and put into service, but before final testing, adjusting, and balancing, inspect each valve for possible leaks. Adjust or replace packing to stop leaks; replace valve if leak persists.

E. Tag each valve and provide a complete listing of valve locations and functions.

3.11 INSTALLATION OF UNIONS AND FLANGES:

A. Install unions and flanges so that piping can be easily disconnected for removal of tanks, equipment, and valves. Provide a minimum of two unions at each three-way valve.

3.12 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.13 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

END OF SECTION

SECTION 22 10 00 - FACILITY WATER DISTRIBUTION

PART 1 GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. The Plumbing section 22 00 00 and Common Work Results for Plumbing section 22 05 00 are hereby made a part of this Section.

1.2 WORK INCLUDED

A. Types of plumbing piping systems specified in this section include the following:

Water Piping

QUALITY ASSURANCE:

B. Manufacturer's Qualifications: Firms regularly engaged in manufacture of plumbing piping systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

C. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required for project.

D. Requirements of Regulatory Agencies:

1. Plumbing Code Compliance: Comply with applicable portions of Uniform Plumbing Code pertaining to selection and installation of plumbing materials and products.

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing piping systems materials and products.

B. Record Drawings: At project closeout, submit Record Drawings of installed piping systems, in accordance with requirements of Division 1.

C. Maintenance Data: Submit maintenance data and parts lists for plumbing piping systems materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual; in accordance with requirements of Division 1.

PART 2 PRODUCTS

2.1 MATERIALS AND PRODUCTS:

A. Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Provide materials and products complying with Uniform Plumbing Code. Where more than one type of material or product is indicated, selection is Contractor's option.

2.2 BASIC PIPES AND PIPE FITTINGS:

1.1 SECTION INCLUDES

A. PEX-a or approved equal pipe and fittings for domestic water piping.

1.2 RELATED SECTIONS

1.3 REFERENCES

A. ASTM International (ASTM):
1. ASTM D 2765 - Test Methods for Determination of Gel Content and Swell Ratio of Crosslinked Ethylene Plastics.
2. ASTM D 6394 - Specification for Sulfone Plastics (SP).
3. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
5. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
6. ASTM F 876 - Standard Specification for Cross-linked Polyethylene (PEX) Tubing.
7. ASTM F 877 - Standard Specification for Cross-linked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems.
8. ASTM F 1960 - Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing.

B. American Water Works Association:
1. AWWA C904 Standard for Cross-linked Polyethylene (PEX) Pressure Pipe, 1/2 in. Through 3 in., for Water Service.

C. American National Standards Institute (ANSI)/National Sanitation Foundation (NSF)

1. ANSI/NSF Standard 14 Plastics Piping System Components and Related Materials.
2. ANSI/NSF Standard 61 Drinking Water System Components - Health Effects.
3. ANSI/NSF Standard 359 Valves for Crosslinked Polyethylene (Pex) Water Distribution Tubing Systems.

D. American National Standards Institute (ANSI)/Underwriters Laboratories, Inc. (UL)

1. ANSI/UL 263 Standard for Safety for Fire Tests of Building Construction and Materials.

E. Canadian Standards Association (CSA)
1. CAN/CSA B137.5 Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications.

F. International Code Council (ICC)
1. International Plumbing Code (IPC)

G. International Association of Plumbing Officials (IAPMO)
1. Uniform Plumbing Code (UPC)

H. National Association of Plumbing, Heating and Cooling Contractors (NAPHCC)
1. National Standard Plumbing Code (NSPC)

I. Plastics Pipe Institute (PPI)
1. PPI Technical Report TR-4/06

J. Uponor, Inc.
1. Uponor Professional Plumbing Installation Guide (UPPIG), 2013.
2. Uponor Plumbing Design Assistance Manual (PDAM), 2014.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Provide manufacturer's product submittal data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall have demonstrated experience on projects of similar size and complexity with documentation proving successful completion of plumbing system installation and/or training by the PEX tubing manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
   1. Store PEX tubing in cartons or under cover to avoid dirt or foreign material from entering the tubing.
   2. Do not expose PEX tubing to direct sunlight for more than 30 days. If construction delays are encountered, cover the tubing to prevent exposure to direct sunlight

1.7 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: PEX-a manufacturer system warranty shall cover piping and fittings for a duration of 25 years from the date of installation. Piping system warranty shall apply to potable water distribution and water service systems constructed of pipe and fitting products sourced from the same manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Uponor or approved equal.

B. Substitutions: Uponor or approved equal.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 PEX PIPE AND FITTINGS

A. PEX-a (Engle-Method Crosslinked Polyethylene) Piping: ASTM F 876/877 by Uponor.

B. PEX-a Fittings: elbows, adapters, couplings, plugs, tees and multi-port tees (1/2 inch through 2 inch nominal pipe size): ASTM F1960 cold-expansion fitting manufactured from the following material types:
   1. UNS No. C69300 Lead-free (LF) Brass.
   2. 20% glass-filled polysulfone as specified in ASTM D 6394.
   3. Unreinforced polysulfone (group 01, class 1, grade 2) as specified in ASTM D 6394.
   4. Polyphenylsulfone (group 03, class 1, grade 2) as specified in ASTM D 6394.
   5. Blend of polyphenylsulfone (55-80%) and unreinforced polysulfone (rem.) as specified in ASTM D 6394.

6. Reinforcing cold-expansion rings shall be manufactured from the same source as PEX-a piping manufacturer and marked "F1960".

C. Pre-Sleeved Piping: PEX-a piping, with a high-density polyethylene (HDPE) corrugated sleeve.

D. Multi-Port Tees: Multiple-outlet fitting complying with ASTM F 877; with ASTM F 1960 inlets and outlets.
1. Engineered polymer branch multi-port tee.
2. Engineered polymer flow-through multi-port tee.
3. Engineered polymer commercial branch multi-port tee.
4. Engineered polymer commercial branch multi-port elbow.
5. Engineered polymer commercial flow-through multi-port tee.

E. Manifolds: Multiple-outlet assembly complying with ASTM F 877; with ASTM F 1960 outlets.
1. Engineered polymer valved manifold.
2. Engineered polymer valveless manifold.
3. Lead - free copper branch manifold.
4. Lead-free copper valved manifold.

2.3 TRANSITION FITTINGS

A. PEX-to-Metal Transition Fittings:
1. Manufacturers: Provide fittings from the same manufacturer of the piping.
2. Threaded Brass to PEX-a Transition: one-piece brass fitting with male or female threaded adapter and ASTM F 1960 cold-expansion end, with PEX-a reinforcing cold-expansion ring.
3. Brass Sweat to PEX-a Transition: one-piece brass fitting with sweat adapter and ASTM F 1960 cold-expansion end, with PEX-a reinforcing cold-expansion ring.

B. PEX-to-Thermoplastic Transition Fittings: CPVC or PP-R to PEX-a Transition: one-piece thermoplastic fitting with male or female threaded adapter and ASTM F 1960 cold-expansion end, with PEX-a reinforcing cold-expansion ring.

2.4 VALVES

A. PEX-to-PEX, Lead Free (LF) Brass Ball Valves (1/2 inch through 2 inch nominal pipe size)
1. Manufacturers: Provide ball valve(s) from the same manufacturer as the piping system.
2. Full-port ball valve: two-piece, ASTM F1960 cold-expansion ends, with PEX-a reinforcing cold-expansion ring.
3. LF brass valve with a positive stop shoulder manufactured from C69300 brass.
4. In compliance with: 250 CWP, ANSI/NSF 359, ANSI/NSF 14/61, cNSF-us-pw_G lead free 0.25% Lead max., ASTM F1960, ASTM F 877.

2.5 EXAMINATION

A. Site Verification of Conditions: Verify that site conditions are acceptable for installation of the domestic water piping. Do not proceed with installation until unacceptable conditions are corrected.

2.6 INSTALLATION

A. Install plumbing system according to approved shop drawings and coordination drawings.

B. Comply with manufacturer's product data, including product technical bulletins, installation instructions and design drawings, including the following.

C. Piping Installation:
1. Install PEX-a Pipe Support, expansion loops, arms and offsets in compliance with Chapter 5 - "System Design and Layout" in the Uponor Plumbing Design Assistance Manual (PDAM).
2. PEX shall not be installed in areas within five feet of UV light.
3. Install piping in compliance with manufacturer's Plumbing Installation Guide.

D. Hangers and Supports:
1. Horizontal PEX-a Piping Hangers: Install CTS hangers suitable for PEX-a piping in compliance with Chapter 6 - "Installation Methods" and local codes, with the following maximum spacing:
   a. 3 inch and below: Maximum span, 32 inches.
   b. 1-1/4 inch and above: Maximum span, 48 inches.
2. Vertical PEX-a Piping: Support PEX-a piping with minimum spacing of 5 feet.
3. Horizontal PEX-a Piping with PEX-a Pipe Channel: Install hangers for PEX-a piping with horizontal support channel in accordance with local jurisdiction and manufacturer's recommendations, with the following maximum spacing:
   a. 3/4 inch and below: Maximum span, 6 feet.
   b. 1 inch and above: Maximum span, 8 feet.
4. PEX-a Riser Supports: Install CTS riser clamps at the base of each floor and at the top of every other floor for domestic hot-water systems. Install mid-story guides between each floor. Install CTS riser clamps at the base of each floor and at the top of every fourth floor for domestic cold-water systems. Install mid-story guides.

E. Piping Schedule:
1. Underground / under-building slab, domestic water piping (3 inch and below) shall be the following:
   a. 1/2 inch through 2 inch - PEX-a piping with engineered polymer (EP) or lead-free brass F1960 cold-expansion fittings. Insulate in compliance with Section - 9 "Plumbing Piping Insulation." Use the fewest possible joints and install per manufacturer's recommendations.
   b. 3 inch - PEX-a piping with lead-free brass compression fittings complying with ASTM F 877. Insulate in compliance with Section "Plumbing Piping Insulation." Use the fewest possible joints and install per manufacturer's recommendations.
   c. 1/2 inch through 2 inch - Pre-insulated PEX-a piping with PEX-foam insulation with engineered polymer (EP) or lead-free brass ASTM F 1960 cold-expansion fittings. Use the fewest possible joints and install per manufacturer's recommendations.
   d. 3/4 inch through 2 inch - Pre-insulated PEX-a piping with multi-layer, closed-closed cell PEX-foam insulation and a corrugated HDPE jacket with engineered polymer (EP) or lead-free brass ASTM F 1960 cold-expansion fittings. Use the fewest possible joints and install per manufacturer's recommendations.
2. In-slab, domestic water piping (2 inch and below) shall be the following: Bare PEX-a piping, pre-sleeved PEX-a piping, or pre-insulated PEX-a piping with engineered polymer (EP) or lead-free brass F1960 cold-expansion fittings. Use the fewest possible joints and install per manufacturer's recommendations.
3. Aboveground domestic water piping (3 inch and below) shall be the following: PEX-a piping, with engineered polymer (EP) or lead-free brass F1960 cold-

expansion fittings, or lead-free brass compression fittings complying with ASTM F 877.

F. Pipe Joint Construction: PEX-a Connections: Install per manufacturer's recommendations. Use manufacturer-recommended cold-expansion tool for ASTM F 1960 connections.

G. Field Quality Control: Do not expose PEX piping to direct sunlight for more than 30 days. If construction delays are encountered, provide cover to portions of piping exposed to direct sunlight.

2.7 BASIC VALVES:

A. Provide valves complying with Division-15 Basic Mechanical Materials and Methods sections, in accordance with the following listing:

1. Sectional Valves:

a. 2 inches and Smaller: Gate valves or ball valves

2. Shutoff Valves:

a. 2 inches and Smaller: Gate valves or ball valves

3. Drain Valves:

a. 2 inches and Smaller: Gate valves or ball valves

4. Check Valves:

a. All Sizes: Swing check valves.

5. Balance Valves:

a. All sizes: Bell and Gossett Circuit Setters.

2.8 HOSE BIBBS:

A. Where located on interior walls: “Woodford” Model 24 with polished bronze body, chrome plated, renewable composition disc, tee key handle, 3/4-inch inlet and hose outlet with non-removable vacuum breaker. Provide 2-1/2 gpm flow restrictor.

B. Where located on exterior walls: “Woodford” Model 25 with rough brass body, renewable composition disc, tee key handle, 3/4-inch inlet and hose outlet with non removable non-freeze vacuum breaker.

2.9 BACKFLOW PREVENTERS:

A. Provide reduced-pressure principle backflow preventers consisting of assembly, including shutoff valves on inlet and outlet, and strainer on inlet, equal to Febco 825Y or 835YD, as required. Backflow preventers shall include test cocks, and pressure- differential relief valve located between two positive seating check valves. Construct in accordance with ASSE Standard 1013.

1. Provide substantial padlock and chain to lock valves in open position, and turn key over to Project Inspector. Provide capped connections at each test cock.

2. Provide two concrete filled, 6 inch diameter pipe ballard to protect all exposed piping from motor vehicle damage.

B. Manufacturer: Subject to compliance with requirements, provide backflow preventers of one of the following:

Febco Sales, Inc.; Subs. of Charles M. Bailey Company, Inc.

Hersey Products, Inc.
Watts Regulator Company

2.10 WATER HAMMER ARESTORS:

A. Provide water branch lines at single fixtures with a manufactured water hammer arrestor. Water hammer arrestors shall be sized per Plumbing Drainage Institute Standard PDI-WH201 “Water Hammer Arrestors.”

1. Where multiple fixtures are located in a row or battery a single or multiple water hammer arrestors, as required, may be used. Multiple fixture installations shall have the arrestor sized and located per standard PDI-WH201 and the manufacturer’s installation instructions.

B. All water hammer arrestors shall have male pipe thread connections.

C. Manufacturer: Subject to compliance with requirements, provide water hammer arrestors of one of the following:

Sioux Chief Manufacturing Co.,”Hydra-Rester”
Precision Plumbing Products, Inc.

PART 3 EXECUTION

3.7 INSPECTION:

A. Examine areas and conditions under which plumbing piping systems are to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Contractor.

3.8 INSTALLATION OF WATER PIPING:

A. Run all water piping generally level, free of traps or unnecessary bends, arranged to conform to the building requirements, and to suit clearance for other mechanical work such as ducts, flues, conduits, and other work. No piping shall be installed so as to cause unusual noise from the flow of water therein under normal conditions.

B. Provide water branch lines at single fixtures with a manufactured water hammer arrestor.

1. Water hammer arrestors shall be located as close to the fixture as possible and in conjunction with the manufacturer’s installation instructions.

2. Where multiple fixtures are located in a row or battery a single or multiple water hammer arrestors, as required, may be used.

3. Multiple fixture installations shall have the arrestor sized and located per standard PDI-WH201 and the manufacturer’s installation instructions.

C. Check final location of rubber rings within couplings on PVC water piping with gauge or as recommended by manufacturer. Make connection to valves with cast iron adapters connected to water pipe with cast iron couplings. Furnish and install anchors or thrust blocks.

3.9 INSTALLATION OF VALVES:

A. Install valves as indicated on Drawings and in the following locations:

1. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.

2. Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere indicated or required to completely drain potable water system.

3.10 INSTALLATION OF BACKFLOW PREVENTERS:

A. Install backflow preventers where indicated on Drawings. Where drain pans are shown on the Drawings, pipe drain pan outlet to nearest floor drain.

3.11 EQUIPMENT CONNECTIONS:

A. Piping Runouts to Fixtures: Provide cold water piping runouts to fixtures of sizes indicated.

3.12 SPARE PARTS:

A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bibb, or faucet installed.

3.13 TEST OF PIPING:

A. Test piping at completion of roughing in, in accordance with the following schedule and show no loss in pressure or visible leaks after a minimum duration of four hours at the test pressures indicated.

TEST SCHEDULE

SYSTEM TESTED	TEST PRESSURE PSIG	TEST WITH
Cold Water Piping	150 lbs. rough-in 100 lbs. after equipment connection	Water

B. Testing equipment, materials, and labor shall be furnished by this Contractor.

C. Repair piping systems sections which fail required piping test, by disassembly and reinstallation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

D. Drain test water from piping systems after testing and repair work has been completed.

3.14 DOMESTIC WATER SYSTEM STERILIZATION:

A. Close open ends of water piping each day to prevent contamination or foreign matter entering pipe during construction. Thoroughly flush out piping to remove any dirt or foreign matter.

B. After flushing of pipe systems, sterilize entire water systems from new point or points of connection before being turned over to Owner for use. Slowly fill system with water and add chlorine chemical agent to produce a minimum of 50 PPM of chlorine in entering water.

C. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.

D. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is not greater than the chlorine residual in the flushing water at all pipe extremities. The procedure shall be repeated if it is shown by bacteriological examination made by an approved testing agency that contamination persists in the system.

E. Domestic water sterilization shall be performed in accordance with Section 3 of the State of Nevada Division of Health, Water Supply Regulations. Approval of State Health Division shall be obtained prior to placing system in service. Submit written report to Health Department as required by State regulations. Provide a copy of report to Architect prior to completion of project.

END OF SECTION

SECTION 22 13 00 - FACILITY SANITARY SEWERAGE

PART 1 PART 1 – GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. The Plumbing section 22 00 00 and Common Work Results for Plumbing section 22 05 00 are hereby made a part of this Section.

1.2 WORK INCLUDED

A. Types of plumbing piping systems specified in this section include the following:

Building Drain Piping
Vent Piping
Waste Piping Specialties
Cleanouts
Floor Drains
Trap Primers

1.3 QUALITY ASSURANCE:

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of plumbing piping systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required for project.

C. Requirements of Regulatory Agencies:

1. Plumbing Code Compliance: Comply with applicable portions of Uniform Plumbing Code pertaining to selection and installation of plumbing materials and products.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing piping systems materials and products.

B. Record Drawings: At project closeout, submit Record Drawings of installed piping systems, in accordance with requirements of Division 1.

C. Maintenance Data: Submit maintenance data and parts lists for plumbing piping systems materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual; in accordance with requirements of Division 1.

PART 2 PRODUCTS

2.1 MATERIALS AND PRODUCTS:

A. Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Provide materials and products complying with Uniform Plumbing Code. Where more than one type of material or product is indicated, selection is Contractor's option.

2.2 BASIC PIPES AND PIPE FITTINGS:

A. Above Ground Building Drain Piping:

1. Cast iron hub and spigot soil pipe; cast iron, hub and spigot soil pipe fittings, with compression gasket joints.

2. Hubless Cast-Iron Soil Pipe and Fittings: CISPI Standard 301 (Latest Edition) and ASTM A-888(Latest Edition). Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.

3. Hubless Cast-Iron Soil Pipe Couplings: Couplings for use in connection with Hubless Cast Iron Soil Pipe and Fittings shall comply with CISPI 310. Shield and clamp assembly shall consist of a 300 series stainless steel corrugated shield, stainless steel bands, number as required for pipe size, and sealing sleeve in conformance with ASTM C564.

4. Exposed Couplings: Provide cast-iron coupling consisting of 2 cast iron housing clamps, stainless steel bolts and nuts, and neoprene gasket in conformance with ASTM C564. Couplings shall be “MG Coupling” as manufactured by MG Piping Products Company.

5. Couplings for use in connection with Hubless Cast Iron Soil Pipe and Fittings located over critical care and sensitive areas as defined by OSHPD shall be tested and certified to be in conformance with Factory Mutual Standard 1680, Class I and ASTM C 1540.

a. Couplings shall consist of a SS type 304 corrugated shield with a minimum thickness of 0.016”. Pipe sizes 4” and less shall have four bands, sizes 5” and greater shall have six bands. Bands shall be type 304 SS with wor gear drive clamps and be torqued to 80 ft-lbs. Gaskets shall meet the requirements of ASTM C-564

b. Available Manufacturers: Subject to compliance with requirements, manufacturers offering grooved piping products which may be incorporated in the work include, but are not limited to, the following:

Husky SD4000
Clamp-All Hi Torque 125

B. At Contractor's option, vertical piping above floor from lavatories and sinks may be standard weight galvanized steel pipe with class 125 black cast iron fittings, drainage pattern, screwed joints.

C. Vent Piping:

1. Sizes 1-1/2 inches and smaller; standard weight galvanized steel pipe with black cast iron drainage fittings, screwed joints.

2. Sizes 2 inches and larger; cast iron soil pipe and fittings as specified above. At Contractor's option, Type L hard drawn copper tubing with cast bronze solder joint fittings and lead free solder may be used above ground in lieu of galvanized steel vent piping and cast iron drainage fittings. Provide test tees as specified.

D. Underground Building Drain Piping:

1. Cast Iron Hub and Spigot Soil Pipe and Fittings: CISPI Standard 301 (Latest Edition) and ASTM A 74(Latest Edition) with compression gasket joints.

2. Hubless Cast-Iron Soil Pipe and Fittings: CISPI Standard 301 (Latest Edition) and ASTM A-888(Latest Edition). Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.

3. Hubless Cast-Iron Soil Pipe Couplings: Couplings for use in connection with Hubless Cast Iron Soil Pipe and Fittings shall comply with CISPI 310. Shield and clamp assembly shall consist of a 300 series stainless steel corrugated shield, stainless steel bands, number as required for pipe size, and sealing sleeve in conformance with ASTM C564.

   a. Couplings below Grade: Provide cast-iron coupling consisting of 2 cast iron housing clamps, stainless steel bolts and nuts, and neoprene gasket in conformance with ASTM C564. Couplings shall be “MG Coupling” as manufactured by MG Piping Products Company.

   b. At contractor’s option couplings below grade may be heavy-duty type in conformance with Factory Mutual Standard 1680, Class I and ASTM C 1540.

   c. Couplings for use in connection with Hubless Cast Iron Soil Pipe and Fittings located over critical care and sensitive areas as defined by OSHPD shall be tested and certified to be in conformance with Factory Mutual Standard 1680, Class I and ASTM C 1540.

      1) Couplings shall consist of a SS type 304 corrugated shield with a minimum thickness of 0.016”. Pipe sizes 4” and less shall have four bands, sizes 5” and greater shall have six bands. Bands shall be type 304 SS with wor gear drive clamps and be torqued to 80 ft-lbs. Gaskets shall meet the requirements of ASTM C-564

      2) Available Manufacturers: Subject to compliance with requirements, manufacturers offering grooved piping products which may be incorporated in the work include, but are not limited to, the following:

         Husky SD4000
         Clamp-All Hi Torque 125

4. At Contractor's option, underground building drain piping not located under exterior slabs, aprons, truck ramps or other concrete surfaces, and more than 2 feet beyond building confines may be:

   a. Vitrified clay pipe; extra strength (XS); extra strength vitrified clay fittings, bell and spigot, resilient gasket joints.

   b. Ring tite, polyvinyl chloride (PVC) sewer pipe and fittings conforming to ASTM D 3034 SDR 35.

2.3 TRAP PRIMER:

A. Provide trap primers as indicated, “Prime-Rite” PR-500, 1/2-inch size, with built-in air gap. Provide with 1/2-inch shut-off valve.

   1. Where one trap primer will be used for more than one trap, provide a distribution unit (DU-2 through DU-4 as required) with feeder piping for a maximum of four traps.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering trap primers which may be incorporated in the work include the following:

   Precision Plumbing Products
   Sioux Chief Manufacturing Co.

2.4 CLEANOUTS:

A. General: Cleanouts of same diameter as pipe shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18 inches from building construction so as to provide sufficient space for rodding.

B. Cleanouts shall have cast iron ferrules and bronze plugs.

C. Cleanouts extending to floor level shall be provided with membrane flange and clamping collar, bronze raised head plug, and nonslip scoriated top.

1. Cleanouts in cast-iron soil or waste lines: Zurn Z-1440A.

2. Cleanouts in walls: Zurn Z-1446-A with stainless steel access cover.

3. Cleanouts on exterior of building: Zurn Z-1440.

a. Provide stainless steel cover and vandalproof screw where located in wall. Zurn Z-1446-A

b. Where located at grade, provide 18- by 18- by 6-inch concrete pad and Zurn Z-1474 heavy duty cover. Provide Z-1440-A cleanout.

4. Cleanouts in floor (concrete): Zurn ZN-1400.

5. Cleanouts in floor (terrazzo): Zurn Z-1400-T.

6. Cleanouts in floor (carpet): Zurn ZN-1400-T-CM.

7. Cleanouts in floor (vinyl tile): Zurn ZN-1400-TX

2.5 FLOOR DRAINS:

A. Provide floor drains of size as indicated on Drawings, and type, including features, as specified herein. Provide flashing ring and clamp at floors with waterproofing membrane. Set top of drain slightly below floor to insure drainage. Install vented P- trap below each drain.

1. Trench Drains: Zurn ZA880-300A.

PART 3 EXECUTION

3.1 INSPECTION:

A. Examine areas and conditions under which plumbing piping systems are to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Contractor.

3.2 INSTALLATION OF SANITARY DRAINAGE SYSTEMS:

A. Make joints in PVC sewer pipe with PVC-type couplings and rubber rings.

B. Check final location of rubber rings within the couplings with gauge or as recommended by the manufacturer. Make joints between PVC pipe and cast iron pipe or fittings using cast iron adapter fittings, installed as recommended by the manufacturer.

1. Ring-Tight cast iron pipe fittings may be used in lieu of standard fittings. Make connection to valves with cast iron adapters connected to the pipe with PVC couplings.

C. Sewer Piping: Run all horizontal sanitary drain piping inside of building on a uniform grade of not less than 1/4-inch per foot. Unless otherwise noted on the plans, piping shall have invert elevations as shown and slope uniformly between given elevations.

D. Run all drainage piping as straight as possible and provide easy bends with long turns; make all offsets at an angle of 45 degrees or less.

E. Grade all vent piping so as to free itself quickly of any water condensation.

F. Where possible, join groups of vent risers together with one enlarged outlet through roof.

G. Install drip pan under storm drain piping, sanitary drain piping, and vent piping that must be run over kitchen areas.

H. Hubless Cast-Iron Joints: Comply with coupling manufacturer's installation instructions and in accordance with CISPI Pamphlet No. 310, latest edition.

I. Bell & Spigot Vitrified Clay Soil Pipe: Comply with pipe manufacturer's installation instructions.

3.3 TEST OF PIPING:

A. Test piping at completion of roughing in, in accordance with the following schedule and show no loss in pressure or visible leaks after a minimum duration of four hours at the test pressures indicated.

TEST SCHEDULE

SYSTEM TESTED		*TEST PRESSURE PSIG*
All Soil, Waste Drain & Vent Piping; All Storm Drains Within Buildings	Fill with water to top of highest vent, allow to stand 2 hrs. or longer as directed by Inspector.	Water
Minimum height of standpipe shall be 10 feet above piping being tested.	Optionally: Air Test per CPC 712.3	Air

B. Testing equipment, materials, and labor shall be furnished by this Contractor.

C. Repair piping systems sections which fail required piping test, by disassembly and reinstallation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

D. Drain test water from piping systems after testing and repair work has been completed.

3.4 INSTALLATION OF DRAINAGE PIPING PRODUCTS:

A. Cleanouts: Install in piping as indicated, as required by Uniform Plumbing Code, at each change in direction of piping greater than 45 degrees, at minimum intervals of 50 feet for piping 4 inches and smaller and 100 feet for larger piping, and at base of each conductor.

B. Flashing Flanges: Install flashing flange and clamping device with each cleanout passing through waterproof membrane.

C. Install drains in accordance with manufacturer's written instructions and in locations indicated. Install floor drains and floor sinks with lip of drain slightly below finished floor to ensure drainage. Coordinate with other Contractors to ensure that floor slopes to drain.

3.5 INSTALLATION OF TRAP PRIMERS:

A. Install as indicated in manufacturers printed literature, with 1/2-inch, type-L, hard copper piping to trap primer connection on floor drains and floor sinks where indicated on Drawings.

3.6 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures, and trim that are installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.7 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.8 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 22 40 00 - PLUMBING FIXTURES AND TRIM

PART 1 – GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Types of plumbing fixtures required for the project include the following:

Water Closets
Urinals
Lavatories
Mop Sink
Service Sink
Drinking Fountains
Hose Spray System

1.3 QUALITY ASSURANCE:

A. Plumbing Fixture Standards: Comply with applicable portions of the following codes and requirements for all work in this section:
California Plumbing Code - CPC
American National Standards Institute - ANSI
Federal Standards - F.S.

B. All plumbing components within the waterways shall comply with the

Safe Drinking Water Act (SDWA) “No-Lead” restrictions of ANSI/NSF

Standard 61 Section 9.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data for plumbing fixtures and trim, including catalog cut of each fixture type and trim item furnished.

B. Maintenance Data: Submit maintenance data and replacement material lists for each type of material listed in this section. Include this data and product data in maintenance manual.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Handle plumbing fixtures carefully to prevent breakage, chipping, and scoring the fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PLUMBING FIXTURES:

A. All fixtures shall be first class in every respect. Accurately line up finished plumbing. Take special care with the roughing- in and finished plumbing where batteries of fixtures occur.

B. Consult Architectural Drawings, as well as Plumbing Drawings, for locations, dimensions and mounting height of plumbing fixtures.
1. Take location and mounting heights for roughing-in from Architectural Drawings.

2. Follow schedule on Plumbing Drawings for roughing-in connections. Set roughing-in for all fixtures exactly as per measurements furnished by the manufacturers of the fixtures used.
3. Roughing-in for lavatories and sinks shall be brought in through the wall under the centerline of the drain from the fixture wherever possible and as close to the fixture as possible.

C. Provide all water supplies to fixtures with compression shut-off stops with IPS inlets, threaded brass nipples at pipe connection, and a lock shield-loose key. Provide combination fixtures with compression stop on each water supply fitting. Provide loose key handle for each stop.
1. Provide 1/2 inch rigid risers for all fixtures, unless otherwise noted.

D. Furnish shut-off valves on hose bibbs directly connected to mains with no intervening valves.

E. Except where otherwise specified, all finish for exposed metal trim on fixture shall be polished chromium plated. This also applies to wall flanges, nuts, and washers. Handles on all faucets and stops shall be all-metal chromium plated.

F. Make connection between fixtures and flanges on soil pipe absolutely gastight and watertight with neoprene-type gaskets (wall-hung fixtures) or bowl wax (floor outlet fixtures). Rubber gaskets or putty will not be permitted.

G. Provide fixtures not having integral traps with "P" traps of chromium-plated cast brass body without cleanout connected to concealed waste in wall and sanitary fittings. Provide fixtures with a 17-gauge minimum traps and tailpiece and grid drain unless otherwise noted.

H. Unions on waste pipes on fixture side of traps may be slip or flange joints with soft rubber or lead gaskets.

2.2 PLUMBING FIXTURE HANGERS AND SUPPORTS:

A. Properly install and support plumbing fixtures as required and specified herein.

B. Carriers and supports shall be J.R. Smith, Zurn, or equal types as recommended by manufacturer for the particular installation and type of fixture being installed.
1. Residential-type fixture supports are not acceptable.

C. Install wall-mounted water closets with combination support and waste fittings, with feet of support securely anchored to floor.

D. Install the following fixtures on concealed support with feet of support securely anchored to floor. Anchor top of support to wall construction in an approved manner.

Wall mounted water closets
Wall mounted urinals
Wall mounted lavatories

E. Install wall-hung lavatories with concealed arms and floor support, with feet of support securely anchored to floor. In addition, anchor top of support to wall construction in an approved manner.

F. Provide fixtures, except water closets, which are installed against walls with concealed arms or brackets securely anchored to studs. Anchor arms or brackets to studs in a manner as directed by Architect.

2.3 PLUMBING FIXTURES:

A. Fixtures shall be Willoughby Industries or approved equal.

B. Plate numbers indicated are Willoughby Industries, complete as illustrated and described, unless otherwise noted. Provide stops for all concealed supplies.

C. Water Closet (WC-1): Toilet shall be Willoughby Model No. ETW-1490-OF or approved equal. Fixture shall be fabricated from 14 gauge, type 304 stainless steel. The construction shall be all welded, with exposed stainless surfaces polished to a #4 satin finish. Standard toilet shall include: elongated toilet bowl with contoured seat, integral crevice-free self-draining flushing rim with positive after fill and fully enclosed 2 1/2" O.D. trap which shall maintain a minimum 2" seal and pass a 2 1/8" ball. Toilet shall be blowout type which requires 35 psi minimum flushing pressure. Model shall meet the requirements of ASME A112.19.3/CSA B45.4. Fixture shall withstand loadings of 5,000 lbs. without permanent damage. Anchoring shall be by standard 6-point system (4 in the wall and 2 in the floor): threaded rods, nuts and washers shall be furnished for walls up to 8" thick. Floor anchoring by others. Unit shall require chase area for installation and maintenance.

D. Urinal (U-1): Wall Hung Front Access High Efficiency Ligature-resistant Urinal shall be Willoughby Model No.ASUW-1314-HEU-FA-BS or approved equal. Fixture is fabricated from all 16 gauge, type 304 stainless steel. The construction shall be all-welded with exposed stainless steel surfaces polished to a satin finish. Contoured interior and exterior surfaces for ease of cleaning. Standard equipment shall include: machined stainless steel flush nozzle, beehive strainer, removable 'P' trap with 1-1/2" FIP waste connection, 3/4" NPT male inlet connection and removable access cover. High Efficiency Urinal shall be washout type requiring 1/8 GPF to 1/2 GPF flush valve and 25 psi minimum flushing pressure. Trap shall be fully enclosed and maintain a 3" seal. Unit requires no chase area for installation and maintenance. Mounting hardware by others. Urinals mounted at 17" rim height to comply with ANSI, ADA and UFAS accessibility requirements. Please consult local code as compliance is subject to the interpretation and requirements of the local code authority.

E. Lavatory (L-1): Lavatory shall be Willoughby Model No. HS-1013-46HC or approved equal. Fixture shall be fabricated from 14 gauge, type 304 stainless steel. The construction shall be all welded, with exposed stainless surfaces polished to a #4 satin finish. Standard lavatory shall include: oval-shaped bowl, 13" x 9 1/2" x 6" deep, stainless steel penal filler/bubbler, fast drain with air vent, elbow waste (1 1/2" F.I.P.) and self-draining soap dish. Cabinet interior shall be sound deadened with fi re-resistant material. Anchoring shall be by standard 4-point system: threaded rods, nuts and washers shall be furnished for walls up to 8" thick. Unit shall require chase area for installation and maintenance.

F. Sink (SS-1): Mop sink shall be Willoughby Model No. CWMS-242412 or approved equal. Entire fixture shall be fabricated from 16 gauge, type 304 stainless steel. The construction shall be all-welded, with exposed exterior stainless surfaces polished to a #4 satin finish. Standard equipment shall include: rectangular shaped sink 24"x24"x12", 3" caulk drain w/ removable strainer.

G. Drinking Fountain (DF-1): Elkay Model #LK4430BF1 or approved equal. Unit shall be of tubular steel construction. Bottle Filler unit shall include laminar flow and front pushbutton activation. Stainless steel contoured basin with vandal-resistant one-piece bubbler, if applicable. Shall comply with ADA guidelines and be certified to lead-free compliance including NSF/ANSI 61, CA 1953 and the Safe Drinking Water Act.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION:

A. Examine roughing-in work of domestic water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors, substrates,

and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Install plumbing fixtures of types indicated where shown and at mounting height indicated on Architectural Drawings in accordance with fixture manufacturer's written instructions, roughing-in Drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of the Uniform Plumbing Code pertaining to installation of plumbing fixtures.

B. In all cases where plumbing fixtures are mounted on or against building walls of concrete or other materials having relatively rough or non-planar surfaces, it shall be the responsibility of this Contractor to provide any necessary grout or backing materials required to facilitate fixture mounting and eliminate void spaces between fixtures and wall to ensure adequate bearing contact.

1. On completion of installation, provide silicone sealer at all points of fixture contact with walls or floors.

C. Any fixture broken, cracked, or otherwise damaged during installation must be replaced by Contractor at his own expense.

3.3 TRAPPING AND VENTING OF FIXTURES:

A. Trap and vent all plumbing fixtures in accordance with California Plumbing Code, whether or not shown on Drawings. Strictly adhere to any local codes. Only exceptions to above will be those fixtures which are specially noted herein or on Drawings to be provided with special wastes.

B. No vent shall intersect another vent at a point less than 6 inches above extreme overflow level of highest fixture served.

C. Take vents off top half of horizontal runs and grade so as to free vents quickly of any water or condensation.

3.4 ADJUSTMENT OF PLUMBING PIPING SYSTEM:

A. Test and adjust all flush valves so that each fixture receives the proper amount of water. Regulate all faucets, bibbs, drinking fountains, etc. to the approval of the Architect so that the entire system is left in first-class condition.

B. Clean fixtures, equipment, and materials installed under this contract. Remove cement, plaster, paint and/or rust, etc. Dirt, rubbish, paint spots, or grease on walls or fixtures for which this Contractor is responsible must be removed by him.

3.5 CLEAN AND PROTECT:

A. Clean plumbing fixtures of dirt and debris upon completion of installation.

B. Protect installed fixtures from damage during the remainder of the construction period.

3.6 FIELD QUALITY CONTROL:

A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

3.7 EXTRA STOCK:

A. Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt. Furnish one device for every 10 units.

3.8 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.9 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

FOR EACH USE OF THE FOLLOWING SPEC - REVISE THE INSULATION THICKNESS FOR EACH TYPE OF PIPE USING THE FORMULAE ON PAGE 38 OF THE 1988 BUILDING ENERGY EFFICIENCY STANDARDS.

4.0 x Table 2-53E Thickness / Actual R value

SECTION 23 07 00 - HVAC INSULATION

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. This section is a Section 23 Basic Materials and Methods section and is a part of each Section 23 section making reference to mechanical insulation specified herein.

1.2 WORK INCLUDED:

A. Types of mechanical insulation specified in this section include the following:

1. Ductwork System Insulation:

Exhaust Ducts

1.3 QUALITY ASSURANCE:

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of mechanical insulation products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

C. Install thermal insulation products on equipment in accordance with manufacturer's written instructions and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

D. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesives) with flame-spread rating of 25 or less and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation. Submit schedule showing manufacturer's product number, K-value, thickness, density, and furnished accessories for each mechanical system requiring insulation. Include complete description of installation methods with this submittal.

B. Maintenance Data: Submit maintenance data and replacement material lists for each type of mechanical insulation. Include this data and product data in maintenance manual.

PART 2 - PRODUCTS

2.1 DUCTWORK:

A. Interior, concealed ductwork:

1. Wrap all concealed supply air ductwork, all concealed return air ductwork, all outside air ductwork and sound traps, unless indicated otherwise, with 1-1/2-inch thick, 1-pound density, Schueller, Microlite, or equal, fiberglas duct insulation with reinforced foil vapor retarder facing, lapped four inches and held in place by 16-gauge galvanized wire tied on 12-inch centers. Staples or adhesives are not acceptable for installation of insulation.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include the following:

CertainTeed Corporation
Schuller Corporation
Owens-Corning Fiberglas Corporation
Polyguard Alumaguard 60

PART 3 – EXECUTION

3.1 INSTALLATION OF DUCTWORK INSULATION:

A. Install insulation products in accordance with manufacturer's written instructions and, in addition, lap a minimum of four inches and hold in place by 16-gauge galvanized wire tied on 12-inch centers. Staples or adhesives are not acceptable for installation of insulation.

B. Extend ductwork insulation without interruption through walls, floors, and similar ductwork penetrations, except piping through fire walls and where otherwise indicated.

C. Lined Ductwork: Except as otherwise indicated, omit insulation on ductwork where internal insulation or sound-absorbing linings have been installed.

3.2 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective insulation. Leave entire work in condition satisfactory to Architect. At completion, carefully clean equipment installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.3 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 23 31 00 - HVAC DUCTS AND CASINGS

PART 1 – GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. This section is a Section 23 Basic Materials and Methods section and is a part of each Section 23 section making reference to mechanical insulation specified herein.

1.2 WORK INCLUDED:

A. Types of ductwork required for this project include the following:

Sheet Metal Ductwork

B. Construct all other ductwork for 2-inch w.g. pressure class, except as noted, per SMACNA requirements.

1.3 QUALITY ASSURANCE:

A. Installer: A firm with at least three years of successful installation experience on projects similar to that required for this work.

1. For work on fiberglass ductwork provide statement from manufacturer indicating that the manufacturer accepts this fabricator to be a qualified fabricator.

B. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) for all work in this section.

C. ASHRAE Standards: Comply with American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE) recommendations, latest edition, for all work in this section.

D. NFPA Compliance: Comply with ANSI/NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems," and ANSI/NFPA 90B, "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's specifications on manufactured products and factory-fabricated ductwork, used for work of this section.

B. Record Drawings: At project close-out, submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets in accordance with requirements of Division 1.

PART 2 - MATERIALS

2.1 GENERAL:

A. Where ductwork is exposed to weather, the ductwork shall be cross-broken, to eliminate any possibility of standing water on the ducts.

2.2 SEALANTS:

A. Duct sealant shall be water based fire resistive with a UL 181B listing, non-fibrated sealant for use on low, medium and high velocity ducts. Sealant VOC levels should also meet S.C.A.Q.M.D. Rule #1168 (LEED IEQ 4.1) classified as an architectural sealant and be mildew resistant as tested by ASTM G21 with 0 growth rating. Sealant shall be rated to 10 inches water gauge. Sealant to be installed in accordance with the manufacturer’s instructions. Pressure-sensitive tapes are not acceptable.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering factory-fabricated ductwork which may be incorporated in the work include the following:

MANUFACTURER	PRODUCT
Hardcast	Iron-Grip 601
Foster	32-19
Childers	CP-146

B. Where seams are exposed to weather, ductwork shall be covered with fibrated water based duct sealant with a UL 181B-M listing, be UV inhibited, and incorporate fiber reinforcement.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering factory-fabricated ductwork which may be incorporated in the work include the following:

MANUFACTURER	PRODUCT
Hardcast	Versa-Grip 181
Foster	32-17
Childers	CP-148

2.3 TWO-INCH PRESSURE CLASS DUCTWORK MATERIALS:

A. Sheet Metal Ductwork: Except as otherwise indicated, fabricate ductwork with commercial grade of galvanized steel.

B. Round supply ductwork shall be of the same materials, gauges, and construction as that indicated for 4 inch pressure class ductwork.

C. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim, and angles for support of ductwork.

2.4 TWO-INCH PRESSURE CLASS FABRICATION:

A. Shop fabricate ductwork in 4-, 8-, 10- or 12-foot lengths, unless otherwise indicated or required, to complete runs. Pre-assemble work in shop to greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for reassembly and coordinated installation.

B. Shop fabricate ductwork of gauges and reinforcement complying with SMACNA HVAC Duct Construction Standards, latest edition.

C. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division-15 section "DUCT ACCESSORIES" for accessory requirements.

D. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1.5 times associated duct width and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers.

1. Round Fittings: The following round duct fittings shall be used: two-piece, die-stamped, 45-degree to 90-degree elbows for sizes up to 8 inches; five-piece, 90-degree fully welded elbows for sizes over 8 inches; Lo-Loss conical tees; Lo-Loss reducing tees; Lo-Loss 90-degree cross; bullhead tees; bullhead reducing tees; and conical laterals. All reducers shall be placed after a tap has been made on the duct main. Reducers shall be long-taper style. No exceptions will be made on the above noted fitting requirements.

2.5 FLEXIBLE DUCTS:

A. Flexible ducts may be used in concealed areas where detailed and as specified.

B. Factory insulate all flexible ducts with one-inch thick, one- pound density fiberglass insulation and wrap with factory- installed vapor barrier jacket. Ducts shall be U.L. approved and tested and meet Class 1 requirements of NFPA 90A. Make elbows to maintain R/W-1.5.

C. Flexible ducts upstream of air terminal units shall be Thermaflex M-KC with maximum length of five feet.

D. Flexible ducts from rigid runouts to registers shall be thermaflex M-KE with maximum length of three feet. Flexible duct shall have no bends greater than 45 degrees. Specifications and any applicable drawings or details will be strictly enforced.

E. Flexible ducts shall consist of an exterior reinforced laminated vapor barrier, 1-1/2-inch thick fiberglass insulation (K= .25 @ 75 degrees F), encapsulated spring steel wire Helix and impervious, smooth, non-perforated interior vinyl liner. Individual lengths of flexible ducts shall contain factory- fabricated steel connection collars.

PART 3 - EXECUTION

3.1 INSTALLATION OF DUCTWORK:

A. Assemble and install ductwork to achieve air tight and noiseless (no objectionable noise) systems capable of performing each indicated service.

B. Install each run with minimum of joints. Align ductwork accurately at connections within 1/8- inch misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of type which will hold ducts true to shape and to prevent buckling.

C. Seal ductwork after installation to seal class required and method prescribed in SMACNA "HVAC Leakage Test Manual," latest edition.

Duct Class	Up to 2 in. wg	3 in. wg	4 in. – 10 in. wg or exposed to weather
Seal Class	C	B	A
Sealing	Transverse Joints Only	Transverse Joints and Seams	Joints, Seams, and all Applicable Wall Penetrations
Leakage Class			
Rectangular Metal	16	8	4
Round Metal	8	4	2

1. Sealant shall be applied 3 inches wide and 32 mils wet film thickness.

2. In ducts of greater than 2” pressure class, or exposed to weather, sealant shall be applied to duct to minimum 3 inches wide, 18 mil thick, scrim applied over the sealant then another 18 mil of sealant applied over the scrim.

D. Seal ductwork after installation to seal class required and method prescribed in SMACNA "HVAC Leakage Test Manual," latest edition.

E. Support ductwork in manner complying with SMACNA "HVAC Duct Construction Standards," latest edition, hangers and supports sections. Where special hanging of ductwork is detailed or shown on Drawings, Drawings shall be followed.

3.2 CLEANING AND PROTECTION:

A. Clean ductwork internally, unit by unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or where ductwork is to be painted.

B. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.

C. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

3.3 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.4 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, and tools, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 23 37 00 - AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. Division - 15 Basic Mechanical Materials and Methods apply to work of this section.

1.2 WORK INCLUDED:

A. Types of ductwork accessories required for this project include the following:

outlets

1.3 QUALITY ASSURANCE:

A. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) HVAC Duct Construction Standards (Metal and Flexible), latest edition, for all work in this section.

B. ASHRAE Standards: Comply with American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) recommendations, latest edition, for all work in this section.

C. NFPA Compliance: Comply with ANSI/NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," and ANSI/NFPA 90B, "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction, and installation instructions.

PART 2 - MATERIALS

2.1 AIR OUTLETS:

A. Grilles shall be selected and guaranteed by manufacturer to operate without objectionable noise or draft.

B. Furnish and install sponge rubber gaskets between grilles and grounds of finished surfaces. Wood grounds will be furnished by others. Metal grounds shall be furnished by this Contractor. Sidewall grilles and registers shall be provided with dull prime coat finish, unless noted otherwise. All supply diffusers, registers, and grilles located at ceiling shall have factory- applied, bone-white finish.

C. Paint visible ductwork behind grilles, registers, and diffusers dull black.

D. Outlet

Exhaust/Return Registers	Krueger Series S-480V with OBD. Provide full 24 x 24 ceiling plates at gyp. board ceilings, with frame style to suit gyp. board style.

E. General: Except as otherwise indicated, provide manufacturer's standard ceiling air diffusers where shown of size, shape, capacity, and type indicated; constructed of materials and components as indicated and as required for complete installation. Provide diffusers with border styles that are compatible with adjacent ceiling systems and that are specifically manufactured to fit into ceiling module with accurate fit and adequate support. Refer to general construction Drawings and specifications for types of ceiling systems which will contain each type of ceiling air diffuser.

F. Available Manufacturers: Subject to compliance with requirements, manufacturers offering air outlets and inlets which may be incorporated in the work include the following:

Krueger
Titus
Anemostat

PART 3 - EXECUTION

3.1 INSTALLATION OF AIR OUTLETS AND INLETS:

A. Install outlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to ensure that products serve intended functions.

B. Locate ceiling registers/grilles as indicated on general construction "Reflected Ceiling Plans." Unless otherwise indicated, locate units in center of acoustical ceiling modules.

C. Examine areas and conditions under which outlets and inlets are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

D. Ceiling-mounted air terminals or services shall be positively attached to the ceiling suspension main runners or to cross runners with the same carrying capacity as the main runners.

E. Terminals or services weighing not more than 56 pounds shall have two No. 12 gauge hangers connected from the terminal or service to the structure above. These wires may be slack.

F. Terminals or services weighing more than 56 pounds shall be supported directly from the structure above by approved hangers.

3.2 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures, and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.3 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.4 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 23 70 00 - HVAC Equipment

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT:

A. The Conditions of the Contract (General, Supplementary and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. Division-23 Basic Mechanical Materials and Methods apply to work of this section.

1.2 WORK INCLUDED:

A. Types of fans and ventilators required for project include the following:

Exhaust Fan
Electric baseboard heater

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of material listed in this SECTION.

B. Maintenance Data: Submit maintenance data and replacement material lists for each type of material listed in this SECTION. Include this data and product data in maintenance manual.

PART 2 - MATERIALS

2.1 Exhaust Fan:

A. Centrifugal Ceiling Exhausters: Provide centrifugal ceiling exhausters, designed for ceiling or inline mounting, of type, size and capacity as scheduled.

B. Provide AMCA Certified Ratings Seal for air flow and sound.

C. Type: Provide galvanized steel housing lined with acoustical insulation, adaptable for ceiling or inline installation. Provide centrifugal fan wheels mounted on motor shaft with fan shrouds, all removable for service. Provide integral backdraft damper at fan discharge.

D. Motor: Provide permanent split-capacitor motor, permanently lubricated, with grounded cord and plug.

E. Electrical: Provide junction box for electrical connection on housing, and receptacle for motor plug-in.

F. Speed Control: Furnish remote fan speed control, solid state, capable of controlling fan speed from full speed to approximately half speed. Unless noted otherwise, locate speed controller adjacent to fan.

G. Accessories: Provide manufacturer's standard roof jack, and transition fittings as indicated on drawings or schedules.

H. Available Manufacturers: Subject to compliance with requirements, manufacturers offering centrifugal ceiling exhausters which may be incorporated in the work include the following:

Acme Owner's Representative's Consultanting & Mfg. Co.
Penn Ventilator Co., Inc.
Greenheck

2.2 Electric baseboard heater

A. Furnish and install where indicated on plans, electric baseboard heaters, suitable for continuous operation. Heaters shall be cULus listed. ENCLOSURE: The heaters shall be fabricated of minimum .024 in. steel with minimum .040 in. steel control boxes. Support brackets shall be .035 in. steel. Junction box enclosure to have provisions for incoming and outgoing cable with cable clamp for restraining without additional hardware. Ground wire pigtail provided in each junction box for grounding.

B. FRONT COVER: The front cover shall be fabricated of minimum .048 in. steel.

C. HEATING ELEMENT: The heating element wire shall consist of 80% nickel, 20% chromium, and shall be encased in steel sheath to assure long and trouble free life. Aluminum fins shall be so designed as to block sheath radiation to front and back of heater body and pressure bonded to steel sheath.

D. INSTALLATION: Heaters shall be designed to permit use of supply conductors with 60°C insulation.

E. GENERAL: Navajo White durable textured polyester powder coat finish for corrosion resistance. Linear thermal cut-out shall be factory installed to automatically shut off heater in event of overheating and reactivate heater when temperatures return to normal. The complete heater shall have a height of 6-3/4 inches and a depth of 2-7/8 inches. Heaters shall have cULus approval for mounting on any floor surface including carpeting.

PART 3 - EXECUTION

3.1 GENERAL:

A. Install fans and ventilators where indicated, in accordance with equipment manufacturer's installation instructions, and with recognized industry practices, to ensure that equipment complies with requirements and serves intended purposes.

B. Provide motors so that they cannot be overloaded above nameplate rating throughout the full speed range of the adjustable pitch driving sheave.

C. Fan wheels shall be balanced statically and dynamically near operating speed.

D. Provide drives and guards conforming to the requirements hereinbefore specified.

E. Fan construction, speed, noise level, tip speeds, outlet velocities and efficiencies will be taken into consideration in approval of fans offered. Fans shall be as scheduled on drawings, or approved equal.

3.2 ELECTRICAL CONNECTIONS:

A. Ensure air distribution equipment is wired properly, with rotation in direction indicated and intended for proper performance.

3.3 CARE AND CLEANING:

A. Repair or replace broken, damaged or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Owner's Representative. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.4 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.5 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like and leave premises clean, neat and orderly.

END OF SECTION

SECTION 312001 - STRUCTURAL EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide all site stripping, excavation, fill, backfill, and grading, as specified therein, and as noted on the Drawings.

B. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Geotechnical Engineer: The Owner will retain and pay the expenses of a Geotechnical Engineer for performing certain functions specified in the Contract Documents. The Geotechnical Engineer shall communicate only with the Owner and the Architect, and with the Contractor as directed by the Architect. The Architect shall relay any appropriate instructions to the Contractor within the provisions of the Contract Documents.

B. Testing Agency: Local testing laboratory with a minimum of three years experience in testing soil materials. All reports prepared by the Testing Agency shall be signed by a Professional Engineer registered to practice as a Civil Engineer in the state of Nevada.

C. Testing laboratory shall have the same required qualifications as the Testing Agency but shall be retained by the Owner. Testing laboratory will make field tests as directed of the "in place" materials to assure conformance with Contract Documents.

D. Source Quality Control: Prior to delivery to site, the Testing Agency shall test all imported soil material for conformance with Contract Documents. Also on site fill materials shall be approved by the Geotechnical Engineer prior to placing.

E. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

F. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.

G. In addition to complying with the requirements of governmental agencies having jurisdiction, comply with the directions of the Geotechnical Engineer, as approved by the Architect.

H. Reference Standards:

1. ASTM - American Society for Testing and Materials.
   a. D 422 - Particle Size Analysis of Soils.
   b. D 424 – Plastic Limit and Plasticity Index of Soils.
   c. D 1556 - Standard Test Method for Density of Soil in Place by the Sand Cone Method.
   d. D 1557 - Standard Test Methods for Moisture-Density Relations of Soils Using 10-pound Rammer and 18-inch Drop.

e. D 2487 - Classification of Soils for Engineering Purposes.
f. D 3017 - Moisture Content of Soil and Soil-aggregate in place by Nuclear Methods.

2. State of Nevada, Standard Specifications for Road and Bridge Construction.

1.3 SUBMITTALS

A. Test Reports: Submit test reports on proposed imported materials, and compaction test reports on all compacted materials.

1.4 JOB CONDITIONS

A. Existing Conditions:

1. Soils Data: No soils investigation report was prepared for this project.
   a. The absence of records of investigations of soil or subsurface conditions and/or logs of test borings:
      1) Shall not be construed as a waiver of the Contractor's duty to examine the site of the Work as contemplated and the Contractor is cautioned to make such independent investigations and examinations as he deems necessary to satisfy himself as to the subsurface conditions to be encountered in the performance of the Work.
      2) Will not relieve the Contractor from the risk of unanticipated soil or subsurface conditions or from properly fulfilling the terms of the Contract or the Contract Sum.
2. Information shown on the Drawings regarding existing site conditions is believed to be correct, but it is not guaranteed. Contractors shall visit the site for necessary information and data regarding present ground levels, ground water level, conditions of property, locations and size of obstructions, and access, etc.
3. Where existing utilities are encountered which are not shown on the Drawings or evident from a site inspection, contact the Architect immediately for instructions. If such lines are inadvertently broken through no fault of the Contractor's operation, they shall be repaired by the Contractor, and an adjustment will be made in payment by the Owner. Breakage of lines shown on the Drawings or evident by a site inspection will be repaired by the Contractor at no increase in Contract Sum.

B. Protection:

1. Provide, and maintain all barricades, shoring, bracing, etc., as required by federal and State codes. Contractor shall assume all responsibility for damage to utilities, streets, etc., that may be caused by this Work.
2. Maintain temporary drainage routes during construction so that rainfall or snow-melt will drain from site and not accumulate or pond.

C. Sequencing, Scheduling and Coordination: The Contractor may schedule and sequence his operations as he desires to optimize the Work of this SECTION.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For structural fill and backfill use imported or approved on-site materials which are non-expansive conforming to the following: Granular soil, free of organic material and debris and free of clods, lumps and rocks larger than 4-inch diameter. Material shall be reasonably well graded with not more than 40-percent passing a No. 200 sieve, not more than 70-percent passing a No. 40 sieve, and not less than 70 percent passing a ¾" sieve, liquid limit – 35 maximum, plastic index – 15 maximum. All material shall be approved by the Geotechnical Engineer prior to delivery and use.

B. Site non-structural fill may be any on site materials free of debris and rocks larger than 4-inch diameter or imported materials as specified in "A" above.

C. Drain Rock: Provide clean, crushed 1" minus rock or open graded drain rock, or use a ¾" rock topped with chips to prevent concrete from penetrating the drain rock. Drain Rock materials shall be approved by the Geotechnical Engineer prior to delivery and use.

D. Aggregate Base for interior concrete slabs, exterior concrete slabs, and sidewalk base: Comply with Nevada Highway Department Type 2, Class B, Aggregate Base.

E. Moisture Barrier: A moisture barrier shall be provided under all interior slabs on grade unless noted otherwise. It shall be placed directly below the aggregate base. The moisture barrier shall be Mirafi "MCF-1212", Stego Wrap 15 mil, or approved equal.

F. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Lay out the building and all site work in conformance with Contract Documents. Establish necessary benchmarks. Protect them and existing benchmarks shown on the Site Plan, until completion of the Work.

3.3 PERFORMANCE

A. Perform no earthwork during inclement weather, or when excessive moisture is present in the fill material.

B. Should rainfall or snow-melt occur following footing excavation and prior to pouring footing, dry the excavation thoroughly and recompact the soils below the footing prior to placing footing.

C. Use no frozen fill. Place no fill on frozen ground.

D. When rains or snow-melt interrupt fill operations, inspect the surface before more fill is placed to assure that detrimental conditions do not exist.

E. Clearing and Grubbing: The areas to receive compacted fill for support of foundations, paving, and slabs shall be stripped of all debris, fill soils, crop growth, vegetation, surface trash, roots larger than 2 inches in diameter, and incidental topsoils as determined by the Geotechnical Engineer.

F. Stripping: The upper 12", as determined by the Geotechnical Engineer, shall be removed from structural areas prior to placement of footings, aggregate base, or structural fill. Also any existing debris and former construction shall be completely removed from the site.

G. Excavation:

1. Excavate as necessary to obtain required subgrade elevations.
2. Excavate as necessary to allow room for placement and removal of foundation formwork.
3. Form all footings with wood, metal, or earth forms as specified in SECTION 031000, "CONCRETE FORMWORK."

H. Compaction of Exposed Soils: The soils exposed by excavations, which are to receive compacted fill or footings, shall be scarified, watered or dried as necessary to obtain the proper moisture content as directed by the Geotechnical Engineer, and compacted to a depth of 12”, to at least 95-percent of maximum dry density. If, in the opinion of the Geotechnical Engineer, the existing soils at the bottom of the footing excavations are at 95-percent of maximum dry density or above, then these soils may not require scarification and recompaction, as determined by the Geotechnical Engineer.

I. Fill and Backfill:

1. Fill as required to obtain required subgrades.
2. Backfill foundations and stemwalls.
3. Place fill and backfill materials in 8-inch thick maximum loose layers. In general, place in horizontal layers extending uniformly over the area to be filled. Compact each layer as specified prior to placing the subsequent layer.
4. Water or dry fill materials as necessary to obtain the proper moisture content as directed by the Geotechnical Engineer. These soils shall then be compacted to the following minimum densities, based on ASTM D1557 Method A or C.
   a. Structural fill - at least 95-percent dry density for fills under footings or slabs on grade.
   b. Non-structural fill on site - 90-percent minimum dry density.

J. Moisture Barrier:

1. Where moisture barrier is required by plans, place moisture barrier beneath aggregate base. Place, lap and tape seams in accordance with manufacturer recommendations.

K. Aggregate Base:

1. Provide the aggregate base placed on top of the moisture barrier membrane and compact to at least 95 percent under pavement and other exterior and interior slabs. Also compact the upper 12” of subgrade below this base to 95 percent relative compaction.
2. Establish finish grade of base at the required elevation with a level uniform surface varying not more than 1/2-inch when measured in any direction with a 10-foot straight edge.
3. Compact drainrock by two passes at right angles with an approved vibratory compactor.

L. Site Grading:

1. After completion of all excavation, fill and backfill, rake surface to a 4-inch depth to remove all rocks and debris in excess of 2-inches in diameter. Remove this material from the site.
2. Grade all areas including excavated and filled sections and transition areas to obtain a finished surface, reasonably smooth, compacted, and free from irregular surface changes. Leave all ditches, swales, and gutters finished to drain readily.

3.4 FIELD QUALITY CONTROL

A. Soil Compaction Test: The Owner will pay the testing Laboratory for the first compaction test at any test location. All retests required because fill materials were not compacted to the required density shall be paid for by the Contractor.

B. The Geotechnical Engineer shall review all sitework and footing excavations before any concrete is cast, and submit a letter of compliance to the Architect. The Geotechnical Engineer shall review all backfill materials prior to placement and observe backfill operations. A letter of compliance shall be submitted to the Architect stating that fills have been constructed per the requirements of these Specifications.

C. Provide at least the following tests to the approval of the Geotechnical Engineer:

1. At paved areas, at least one (1) field density test for every 4000 sq. ft. of paved area, but not less than three (3) tests.
2. In each compacted fill layer, one (1) field density test for every 4000 sq. ft. of overlaying area, but not less than three (3) tests.

D. If, in the Geotechnical Engineer's opinion, based on reports of the testing laboratory, subgrade or fills have been placed below specified density, provide additional compacting and testing.

3.5 MAINTENANCE

A. Protection of newly graded areas:

1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds.
2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION 312001

Forms

(to be used following award of bid)

1) **Contract Form**
2) **Performance Bond**
3) **Payment Bond**

PROJECTTITLE
BID # _____
PWP# _____

THIS CONTRACT made and entered into on this ___ day of MONTH, 20____, by and between the City of Sparks, Nevada, a municipal corporation, existing under and by virtue of the laws of the State of Nevada, hereinafter called "City", and **CONTRACTOR,** a qualified Contractor in the class of work required, hereinafter called "Contractor".

W I T N E S E T H

WHEREAS, the City has awarded a contract to Contractor for providing material and/or performing the work hereinafter mentioned in accordance with the proposal of said Contractor;

WHEREAS, the Contractor will provide the material and/or perform the work for the compensation stated in said proposal, an amount which has been arrived at between the parties;

WHEREAS, each party is willing to and does assume joint liability for the contents of this Contract, and each party accordingly agrees that it shall not be construed against any party as a drafting party;

NOW, THEREFORE, IT IS AGREED as follows:

1. **Scope of Work:**
   The scope of work for this contract is generally defined as **TITLE**. The City's Contract Documents and Contractor's Entire Proposal are on file with the City of Sparks. All terms, conditions and requirements contained within these Documents, including any and all bid documents, addenda and specifications issued by the City, are hereby incorporated by reference into this Contract.

   The Contractor shall perform within the time stipulated, the Contract as herein defined and shall provide and furnish any and all of the labor, materials, methods or processes, equipment implements, tools, machinery and equipment, and all utility, transportation and other services required to construct, install and put in complete order for use in a good and workmanlike manner all of the work covered by the Contract in connection with strict accordance with the plans and specifications therein, which were approved by said City and are on file with the City, including any and all addenda issued by the City, and with the other contract documents hereinafter enumerated.

2. **Payment for Project Services**
   As full consideration for the Services to be performed by Contractor, City agrees to pay Contractor as set forth in accordance with the bid and not to exceed fee of **COST** for the project.

   A monthly progress payment in the amount of ninety-five percent (95%) of the value of the work completed may be made every thirty (30) days upon application by the Contractor and certification by the Project Manager that such work has been completed.

Partial payments will be made once each month as the work satisfactorily progresses and after acceptance by the authorized City representative. The progress estimates shall be based upon materials in place, or on the job site and invoiced, and labor expended thereon. From the total of the amount ascertained will be deducted an amount equivalent to five percent (5%) of the whole, which five percent (5%) will be retained by the City until after completion of the entire Contract in an acceptable manner. Any time after fifty percent (50%) of the value of the work has been completed, the City will make any of the remaining partial payments in full.

No such estimates or payments shall be required to be made, when, in the judgment of the City Project Manager, the work is not proceeding in accordance with the provision of the Contract, or when in his judgment the total value of the work done since last estimate amounts to less than Five Hundred Dollars ($500.00).

The cost of materials conforming to the plans and specifications (materials being those which are required to be contained and incorporated in a finished contract bid item) delivered to the project and not at the time incorporated in the work, may also be included in the estimate for payment. No such estimate or payment shall be construed to be an acceptance of any defective work or improper material. The Contractor shall be responsible for, and shall not remove from the project any material that has been included in the estimate for payment.

Final payment shall be made upon the Project Manager certifying that the Contractor has satisfactorily completed the work in conformity with the Contract Documents.

3. Time for Completion:

The Contractor shall deliver the material and/or services called for in the specifications/proposal and within the delivery time specified and in accordance with the terms of the contract. Work shall be completed within _____ days from the Notice to Proceed issued by the City of Sparks Purchasing Division. The Contractor shall not alter or vary any terms or conditions contained or incorporated herein, including but not limited to, the quantity, price, delivery date or date designated as After Receipt of Order (ARO) or date for commencement or completion of services as mutually agreed upon, unless such alteration or variation is consented to in writing by a duly authorized representative of the City.

The City reserves the right to cancel resultant Contract upon ten days written notice in the event the type and quality of the product or work performance is unsatisfactory or in default, subject to Contractor's right to cure as outlined in termination clause.

This is a non-exclusive Contract and the City reserves the right to acquire the material and/or services at its discretion, from other sources during the term of this Contract.

4. No Unlawful Discrimination:

In connection with the performance of work under this Agreement, Contractor agrees not to discriminate against any employee or applicant because of race, creed, color, national origin, disability, sex, sexual orientation or age. Such agreement shall include, but not be limited to, the following: recruitment or recruitment advertising, rates or pay or other forms of compensation, and selection. Any violation of these provisions by Contractor shall constitute a material breach of contract.

In all cases where persons are employed in the construction of public works, preference must be given when the qualifications of the applicants are equal:

A) First: To honorably discharged soldiers, sailors and marines of the United States who are citizens of the State of Nevada.
B) Second: To other citizens of the State of Nevada

If the provisions of this section are not complied with by the contractor engaged on the public work, the contract is void, and any failure or refusal to comply with any of the provisions of this section renders any such contract void and subject to the exceptions contained in this section, no money may be paid out of the State Treasury or out of the treasury of any political subdivision of the State to any person employed on any work mentioned in this section unless there has been compliance with the provisions of this section. Any contractor engaged on a public work or any other person who violates any of the provisions of this section is guilty of a misdemeanor. The penalties provided for in this section do not apply where violations thereof are due to misrepresentations made by the employee or employees.

5. No Illegal Harassment:
Violation of the City's harassment policy, which is incorporated by reference and available from the Human Resource Division, by the Contractor, its officers, employees, agents, vendors, consultants, subcontractors and anyone from whom it is legally liable, while performing or failing to perform Contractor's duties under this Contract shall be considered a material breach of contract.

6. Lawful Performance:
Vendor shall abide by all Federal, State and Local Laws, Ordinances, Regulations, and Statutes as may be related to the performance of duties under this agreement. In addition, all applicable permits and licenses required shall be obtained by the vendor, at vendor's sole expense.

7. Preferences (This Section ☐ IS ☐ IS NOT Applicable to this contract):
To the extent Contractor has sought and qualified for a bidding preference and this project has a value of over $250,000 pursuant to Nevada Revised Statutes Chapter 338, Contractor acknowledges and agrees that the following requirements will be adhered to, documented and attained for the duration of the Project:

1. At least 50 percent of the workers employed on the Project (including subcontractors) hold a valid driver's license or identification card issued by the Nevada Department of Motor Vehicles;

2. All vehicles used primarily for the public work will be (a) registered and (where applicable) partially apportioned to Nevada; or (b) registered in Nevada; and

3. The Contractor shall maintain and make available for inspection within Nevada all payroll records related to the Project.

Contractor recognizes and accepts that failure to comply with any requirements herein shall be a material breach of the contract and entitle the City of Sparks to liquidated damages in the amount set by statute. In addition, the Contractor recognizes and accepts that failure to comply with any

requirements herein may lose its certification for a preference in bidding and/or its ability to bid on any contracts for public works pursuant to NRS Chapter 338.

To the extent Contractor has sought and qualified for a bidding preference and this project has a value of over $250,000 pursuant to Nevada Revised Statutes Chapter 338, each contract between the contractor, applicant or design-build team and a subcontractor must provide for the apportionment of liquidated damages assessed pursuant to this section if a person other than the Contractor was responsible for the breach of a contract for a public work caused by a failure to comply with a requirement of Items 1-5 within this section. The apportionment of liquidated damages must be in proportion to the responsibility of each party for the breach.

8. Prevailing Wages

A. The Contractor and subcontractors shall be bound by and comply with all federal, state and local laws with regard to minimum wages, overtime work, hiring and discrimination, including Chapter 338 of the NRS, which is entitled, "Public Works Projects." The Contractor shall ensure that all employees on the work site are paid in accordance with the CURRENT PREVAILING WAGE RATES AS APPROVED BY THE STATE LABOR COMMISSIONER, whenever the actual value of the Contract totals One Hundred Thousand Dollars ($100,000) or more, or when required by the Supplementary Conditions. A copy of the rates are attached hereto and included herein. If a Change Order causes a Contract to exceed One Hundred Thousand Dollars ($100,000), the State Labor Commissioner may audit the entire Contract period.

When federal money is associated with the project making the Contract subject to both state and federal wage rates, the Contractor shall not pay less than the higher rate when the two rates differ for similar kinds of labor.

Questions involving the Prevailing Wage Rates for the City of Sparks should be referred to the Labor Commissioner, State of Nevada, at (775) 687-4850.

B. Posting of Minimum Wage Rates - In accordance with NRS, Chapter 338, Section 338.020, the Contractor shall post the hourly and daily rate of wages to be paid to each of the classes of mechanics and workers on the site of Work of this Contract in a place generally visible to the workers.

C. Pursuant to NRS 338.060 and 338.070, the Contractor hereby agrees to forfeit, as a penalty to the City of Sparks, not less than Twenty Dollars ($20) nor more than Fifty Dollars ($50) for each calendar day or portion thereof that each worker employed on the Contract is paid less than the designated rate for any work done under the Contract, by the Contractor or any subcontractor under him, or is not reported to the City of Sparks as required by NRS 338.070.

D. The contractor and each subcontractor shall keep or cause to be kept an accurate record showing, for each worker employed by the contractor or subcontractor:
   (1) The name of the worker;
   (2) The occupation of the worker;

(3) If the worker has a driver's license or identification card, an indication of the state or other jurisdiction that issued the license or card; and
(4) The actual per diem, wages and benefits paid to the worker.

In addition, the contractor and each subcontractor shall keep or cause to be kept an accurate record showing, for each worker employed by the contractor or subcontractor who has a driver's license or identification card:
(1) The name of the worker;
(2) The driver's license number or identification card number of the worker; and
(3) The state or other jurisdiction that issued the license or card.

E. The records in Section D above must be open at all reasonable hours to the inspection of the City of Sparks, and its officers and agents. A copy of the each record for each calendar Month for the General Contractor and all Sub-Contractors must be submitted to the City of Sparks no later than 15 days after the end of each month for the previous months' wages.

9. Acceptance by the City:
It is expressly understood and agreed that all materials provided and/or work done by the Contractor shall be subject to inspection and acceptance by the City at its discretion, and that any progress inspections and approval by the City of any item or work shall not forfeit the right of the City to require the correction of faulty workmanship or material at any time during the course of the work, although previously approved by oversight. Nothing herein contained shall relieve the Contractor of the responsibility for proper construction and maintenance of the work, materials and equipment required under the terms of this Contract until all work has been completed and accepted by the City.

10. Waiver:
No waiver of any term, provision or condition of this Contract, whether by conduct or otherwise, in any one or more instances, shall be deemed to be nor shall it be construed as a further or continuing waiver of any such term, provision or condition of this Contract. No waiver shall be effective unless it is in writing and signed by the party making it.

11. Notices:
All notices required to be given in writing by this Contract shall be deemed to be received (i) upon delivery if personally delivered, or (ii) when receipt is signed for if mailed by certified or registered mail, postage prepaid, or by express delivery service or courier, when addressed as follows (or sent to such other address as a Party may specify in a notice to the others):

PURCHASING MANAGER	CONTRACTOR:
CITY OF SPARKS	_____
431 PRATER WAY	_____
PO BOX 857	_____
SPARKS, NV 89432-0857	_____

12. Arbitration:
Any and all disputes, controversies or claims arising under or in connection with this Contract, including

without limitation, fraud in the inducement of this Contract, or the general validity or enforceability of this Contract, shall be governed by the laws of the State of Nevada without giving effect to conflicts of law principles, may be submitted to binding arbitration before one arbitrator, and shall be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association in a private manner in Washoe County, Nevada. This award shall be final and judgment may be entered upon it in any court having jurisdiction thereof. In reaching this final award, the arbitrator shall have no authority to change or modify any provision of this Contract. All other expenses of arbitration shall be borne equally by the parties. All fees, including legal fees, shall be borne by the party who incurred them. All costs of enforcement shall be borne by the losing party. Each party shall have the right to discovery in accordance with the Nevada Rules of Civil Procedure.

13. Jurisdiction and Venue:

In the event the arbitration award is challenged, any action or proceeding seeking to do so must be brought in the courts of the State of Nevada, County of Washoe, or if the party can acquire subject-matter jurisdiction, in the United States District Court for the District of Nevada in the City of Reno. Each of the parties consents to the personal jurisdiction of such courts (and of the appropriate appellate courts) in any such action or proceeding and waives any objection to venue laid therein. Process in any action or proceeding referred to in the preceding sentence may be served on either party by sending it certified mail to the respective addresses designated for notice.

14. Indemnification:

To the fullest extent permitted by law, upon award, Contractor shall hold harmless, indemnify, defend and protect City, its affiliates, officers, agents, employees, volunteers, successors and assigns ("Indemnified Parties"), and each of them from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorney's fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever ("Claims") arising out of or related to any act or omission of Contractor, its employees, agents, representatives, or Subcontractors in any way related to the performance of work under this Agreement by Contractor, or to work performed by others under the direction or supervision of Contractor, including but not limited to:

1. Personal injury, including but not limited to bodily injury, emotional injury, sickness or disease, or death to persons;
2. Damage to property of anyone, including loss of use thereof;
3. Penalties from violation of any law or regulation caused by Contractor's action or inaction;
4. Failure of Contractor to comply with the Insurance requirements established under this Agreement;
5. Any violation by Contractor of any law or regulation in any way related to the occupational safety and health of employees.

In determining the nature of the claim against City, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against City.

If City's personnel are involved in defending such actions, Contractor shall reimburse City for the time and costs spent by such personnel at the rate charged City for such services by private professionals.

In cases of professional service agreements, requiring professional liability coverage:
If the insurer by which a Consultant is insured against professional liability does not so defend the City and applicable agents and/or staff, and the Consultant is adjudicated to be liable by a trier of fact, the City shall be entitled to reasonable attorney's fees and costs to be paid to the City by the Consultant in an amount which is proportionate to the liability of the of the Consultant.

Nothing in this contract shall be interpreted to waive nor does the City, by entering into this contract, waive any of the provisions found in Chapter 41 of the Nevada Revised Statutes.

15. Licenses and Permits:

The Contractor shall procure at his own expense all necessary licenses and permits and shall adhere to all the laws, regulations and ordinances applicable to the performance of this Contract.

All Contractors, Sub-Contractors and Suppliers doing business within the City of Sparks are required to obtain a current business license from the City of Sparks prior to commencement of this contract. Per Sparks Municipal Code Section 5.08.020A: "It is unlawful for any person to transact business in the City without first having obtained a license from the City to do so and without complying with all applicable provisions of this title and paying the fee therefore."

16. Insurance:

BIDDERS' ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT BIDDERS CONFER WITH THEIR RESPECTIVE INSURANCE CARRIERS OR BROKERS TO DETERMINE IN ADVANCE OF BID SUBMISSION THE AVAILABILITY OF INSURANCE CERTIFICATES AND ENDORSEMENTS AS PRESCRIBED AND PROVIDED HEREIN. IF THE APPARENT LOW BIDDER FAILS TO COMPLY STRICTLY WITH THE INSURANCE REQUIREMENTS, THAT BIDDER MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Should work be required on City premises or within the public right-of-way, upon award of the contract, the bidder shall provide proof of Commercial General Liability Insurance and Automobile Liability, Professional Liability and Workers' Compensation if applicable, prior to initiation of any services under City, Bid, Proposal or Contract. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks and shall meet the following minimum specifications:

Contractor shall at its own expense carry and maintain at all times the following insurance coverage and limits of insurance. Contractor shall also cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified herein. All insurers must have AM Best rating not less than A-VII, and be acceptable to the City. Contractor shall furnish copies of certificates of insurance evidencing coverage for itself and for each subcontractor. Failure to maintain the required insurance may result in termination of this contract at City's option. If Contractor fails to maintain the insurance as set forth herein, City shall have the right, but not the obligation, to purchase said insurance at Contractor's expense.

Contractor shall provide proof of insurance for the lines of coverage, limits of insurance and other terms

specified below prior to initiation of any services. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks and shall meet the following minimum specifications,

Contractor and any of its subcontractors shall carry and maintain coverage and limits no less than the following or the amount customarily carried by Contractor or any of its subcontractors, whichever is greater.

Applicable to this Contract	Insurance Type	Minimum Limit	Insurance Certificate	Additional Insured	Waiver of Subrogation
Yes	General Liability	$1,000,000	✔	✔	✔
Yes	Automobile Liability	$1,000,000	✔	✔	
Yes	Workers' Compensation	Statutory	✔		✔
Yes	Employer's Liability	$1,000,000	✔		
No	Professional Liability	$1,000,000	✔		
No	Pollution Legal Liability	$1,000,000	✔		

Commercial General Liability

Contractor shall carry and maintain a Commercial General Liability policy providing coverage for liability arising from premises, operations, independent contractors, products-completed operations liability, personal and advertising injury, and liability assumed under an insured contract (including, but not limited to, the tort liability of another assumed in a business contract).

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, employment-related practices, unless Subcontractor carries and maintains separate policies providing such coverage and provides Contractor evidence of insurance confirming the coverage.

Minimum Limits of Insurance

$1,000,000 Each Occurrence Limit for bodily injury and property damage
$2,000,000 General Aggregate Limit
$2,000,000 Products and Completed Operations Aggregate Limit
$10,000 Medical Expense Limit

If Commercial General Liability Insurance or other form with a general aggregate limit is used, the general aggregate limit shall be increased to equal twice the required occurrence limit or revised to apply separately to this PROJECT or LOCATION.

Coverage Form

Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Commercial General Liability (CGL) "Occurrence" form CG 00 01 04/13 or substitute form providing equivalent coverage.

Additional Insured
City, its officers, agents, employees, and volunteers are to be included as insureds in respects to damages and defense arising from: activities performed by or on behalf of Contractor, including the insured's general supervision of Contractor; products and completed operations of Contractor; premises owned, occupied, or used by Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Primary and Non-Contributory
Contractor's insurance coverage shall be primary insurance as it relates to City, its officers, agents, employees, and volunteers. Any insurance or self-insurance maintained by City, its officers, employees, or volunteers shall be excess of Contractor's insurance and shall not contribute with it in any way.

Separation of Insureds
Contractor's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the limits of the insurer's liability.

Endorsements
A policy endorsement is required listing all required additional insureds. The endorsement for CGL shall be at least as broad as the unmodified ISO additional insured endorsement CG 20 10 11/85 or a substitute form providing equivalent coverage for products and completed operations.

A waiver of subrogation in favor of City shall be endorsed to the policy using an unmodified Waiver of Transfer of Rights of Recovery of Others to Us ISO CG 24 04 05 09, or a substitute form providing equivalent coverage.

Business Automobile Liability

Minimum Limits of Insurance
$1,000,000 Combined Single Limit per accident for bodily injury and property damage or the limit customarily carried by Contractor, whichever is greater. No aggregate limit may apply. Coverage may be combined with Excess/Umbrella Liability coverage to meet the required limit.

Coverage Form
Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Business Automobile Coverage form CA 00 01 10/13, CA 00 25 10/13, CA 00 20 10/13 or substitute form providing equivalent coverage for Automobile Liability Symbol 1 for "Any Auto". If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01.

Additional Insured
City, its officers, agents, employees, and volunteers are to be included as insureds with respect to damages and defense arising from: activities performed by or on behalf of Contractor, including the insured's

general supervision of Contractor; products and completed operations of Contractor; premises owned, occupied, or used by Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Endorsements
A policy endorsement is required listing all required additional insureds. The endorsement for Business Automobile Liability shall be at least as broad as the unmodified ISO CA 20 48 10/13 or a substitute form confirming City's insured status for Liability Coverage under the Who Is An Insured Provision contained in Section II of the coverage form ISO CA 00 01 10/13.

Workers' Compensation and Employer's Liability
Contractor shall carry and maintain workers' compensation and employer's liability insurance as required by NRS 616B.627 or provide proof that compliance with the provisions of Nevada Revised Statutes Chapters 616A-D and all other related chapters is not required. It is understood and agreed that there shall be no coverage provided for Contractor or any Subcontractor of the Contractor by the City. Contractor agrees, as a precondition to the performance of any work under this Agreement and as a precondition to any obligation of the City to make any payment under this Agreement to provide City with a certificate issued by an insurer in accordance with NRS 616B.627 and with a certificate of an insurer showing coverage pursuant to NRS 617.210.

It is further understood and agreed by and between City and Contractor that Contractor shall procure, pay for and maintain the above mentioned coverage at Contractor's sole cost and expense.

Should Contractor be self-funded for workers' compensation and employer's liability insurance, Contractor shall so notify City in writing prior to the signing of this Contract. City reserves the right to approve said retentions, and may request additional documentation, financial or otherwise, for review prior to the signing of this Contract.

Minimum Limits of Insurance
Workers' Compensation: Statutory Limits
Employer's Liability: **$1,000,000** Bodily Injury by Accident – Each Accident
$1,000,000 Bodily Injury by Disease – Each Employee
$1,000,000 Bodily Injury by Disease – Policy Limit

Coverage Form
Coverage shall be at least as broad as the unmodified National Council on Compensation Insurance (NCCI) Workers Compensation and Employer's Liability coverage form WC 00 00 07/11 or substitute form providing equivalent coverage.

Waiver of Subrogation Endorsement
Contractor and its insurer agree to waive their rights of subrogation for any payments made under this coverage. A policy endorsement at least as broad as the unmodified NCCI Waiver of Our Right to Recover

From Others endorsement WC 00 03 13 04/84 or a substitute form providing equivalent coverage is required waiving the insurer's right to recover payments from the City.

OTHER INSURANCE COVERAGES (IF APPLICABLE)

Professional Liability Insurance (if Applicable) $1,000,000 per occurrence limits of liability or whatever limit is customarily carried by the Contractor, whichever is greater, for design, design-build or any type of professional services with a minimum of three (3) years reporting of claims following completion of the project.

Contractors Pollution Liability Insurance (If Applicable)- $1,000,000 per occurrence and $2,000,000 aggregate or whatever amount is acceptable to the City for any exposure to "hazardous materials" as this term is defined in applicable law, including but not limited to waste, asbestos, fungi, bacterial or mold.

Lower tier sub-subcontractors, Truckers, Suppliers: Evidence confirming lower tier subcontractors, truckers and suppliers are maintaining valid insurance prior to beginning work on the project to meet the requirements set forth herein on Subcontractor, including but not limited to all additional insured requirements of Subcontractor.

ALL COVERAGES

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, or non-renewed by either CONTRACTOR or by the insurer, reduced in coverage or in limits except after thirty (30) days' prior written notice has been given to CITY except for nonpayment of premium.

OTHER INSURANCE PROVISIONS

Should City and Contractor agree that higher coverage limits are needed warranting a project policy, project coverage shall be purchased and the premium for limits exceeding the above amount may be borne by City. City retains the option to purchase project insurance through Contractor's insurer or its own source.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to City, its officers, agents, employees, or volunteers.

ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with a Best's rating of no less than A-VII and acceptable to the City.. City, with the approval of the Risk Manager, may accept coverage with carriers having lower Best's ratings upon review of financial information concerning Contractor and insurance carrier. City reserves the right to require that Contractor's insurer be a licensed and admitted insurer in the State of Nevada, or on the Insurance Commissioner's approved but not admitted list.

VERIFICATION OF COVERAGE

Contractor shall furnish City with certificates of insurance and with original endorsements affecting coverage required by this contract. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

Prior to the start of any Work, Contractor must provide the following documents to City of Sparks, Attention: Purchasing Division, P.O. Box 857, Sparks, NV 89432-0857:

A. Certificate of Insurance. Contractor must provide a Certificate of Insurance form to the City of Sparks to evidence the insurance policies and coverage required of Contractor.

B. Additional Insured Endorsements. An original Additional Insured Endorsement, signed by an authorized insurance company representative, must be submitted to the City of Sparks, by attachment to the Certificate of Insurance, to evidence the endorsement of the City of Sparks as additional insured.

C. Policy Cancellation Endorsement. Except for ten days notice for non-payment of premium, each insurance policy shall be endorsed to specify that without thirty (30) days prior written notice to the City of Sparks, the policy shall not be cancelled, non-renewal or coverage and/or limits reduced or materially altered, and shall provide that notices required by this paragraph shall be sent by certified mailed to the address specified above. A copy of this signed endorsement must be attached to the Certificate of Insurance.

D. Bonds (as Applicable). Bonds as required and/or defined in the original bid documents.

All certificates and endorsements are to be addressed to the City of Sparks, Purchasing Division and be received and approved by City before work commences. The City reserves the right to require complete certified copies of all required insurance policies at any time.

SUBCONTRACTORS

Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to all of the requirements stated herein.

MISCELLANEOUS CONDITIONS

1. Contractor shall be responsible for and remedy all damage or loss to any property, including property of City, caused in whole or in part by Contractor, any Subcontractor, or anyone employed, directed, or supervised by Contractor.
2. Nothing herein contained shall be construed as limiting in any way the extent to which Contractor may be held responsible for payment of damages to persons or property resulting from its operations or the operations of any Subcontractors under it.
3. In addition to any other remedies City may have if Contractor fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, City may, at its sole option:
    a. Purchase such insurance to cover any risk for which City may be liable through the operations of Contractor under this Agreement and deduct or retain the amount of the premiums for such insurance from any sums due under the Agreement;
    b. Order Contractor to stop work under this Agreement and/or withhold any payments which become due Contractor here under until Contractor demonstrates compliance

with the requirements hereof; or,

c. Terminate the Agreement.

17. Liquidated Damages:

If the Product is not delivered/Project is not completed within the time stipulated in the bid, the Contractor shall pay to the City of Sparks as fixed, agreed and liquidated damages for delay and not as a penalty (it being impossible to determine the actual damages occasioned by the delay) $_____ for each _____ day of delay until delivery is completed; the Contractor shall be liable to the City of Sparks for the amount herein. This amount may be deducted from money due or to become due to the Contractor as compensation under this proposal in the event the Contractor fails to meet delivery schedules or product specifications.

18. Material Breach of Contract:

In the event Contractor fails to deliver the product and services as contracted for herein, to the satisfaction of the City of Sparks or otherwise fails to perform any provisions of this Contract, the City, after providing five (5) days written notice and Contractor's failure to cure such breach within the time specified in the notice, may without waiving any other remedy, make good the deficiencies and deduct the actual cost of providing alternative products and/or services from payment due the Contractor. Non-performance after the first notice of non-performance shall be considered a material breach of contract.

19. Force Majeure:

Neither party to the Contract shall be held responsible for delay or default caused by fire, riot, acts of God, and/or war which is beyond that party's reasonable control. City may terminate the Contract upon written notice after determining such delay or default will reasonably prevent successful performance of the Contract.

20. Termination:

The City may terminate the Contract for material breach of contract upon ten (10) days written notice and recover all damages, deducting any amount still due the Contractor from damages owed to the City, or seek other remedy including action against all bonds. The Contractor may terminate the Contract for material breach of contract upon thirty (30) days written notice to the City.

21. Assignment:

All of the terms, conditions and provisions of this Contract, and any amendments thereto, shall inure to the benefit of and be binding upon the parties hereto, and their respective successors and assigns. The Contractor shall not assign this Contract without the written consent of the City which will not be unreasonably withheld.

22. Entire Contract:

This Contract constitutes the entire agreement of the parties and shall supersede all prior offers, negotiations, agreements and contracts whether written or oral. Any modifications to the terms and conditions of this Contract must be in writing and signed by both parties.

23. Severability:

If any part of this Contract is found to be void it will not affect the validity of the remaining terms of this

Contract which will remain in full force and effect.

24. Headings:
Paragraph titles or captions contained in this Contract are inserted only as a matter of convenience and for reference only, and in no way define, limit, extend, or describe the scope of this Contract or the intent of any provision herein.

25. Singular Includes the Plural; Gender; Title Reference:
Whenever the singular number is used in this Contract and when required by the context, the same shall include the plural, and the use of any gender, be it masculine, feminine or neuter, shall include all of the genders, and the word "person" or "entity" shall include corporation, firm, partnership, or any other combination or association.

The use of the title "Bidder", "Vendor", "Contractor" or "Consultant" within this contract or associated bid documents shall be deemed interchangeable and shall refer to the person or entity with whom the City of Sparks is contracting for the service or product referenced within this contract.

26. Execution:
The parties agree to execute such additional documents and to take such additional actions as are reasonably necessary or desirable to carry out the purposes hereof. They also agree, acknowledge and represent that all corporate authorizations have been obtained for the execution of this Contract and for the compliance with each and every term hereof. Each undersigned officer, representative or employee represents that he or she has the authority to execute this Contract on behalf of the party for whom he or she is signing.

IN WITNESS WHEREOF, the City of Sparks has caused this Contract to be executed by its officers thereunto duly authorized and the Consultant has subscribed same, all on the day and year first above written.

_____	CITY OF SPARKS, NEVADA
(Vendor)	A Municipal Corporation
By: _____	By:_____
	Geno R. Martini, Mayor
_____	
(Title)	
APPROVED AS TO FORM	ATTEST:
_____	_____
City Attorney	Teresa Gardner, City Clerk

CITY OF SPARKS, NEVADA - BOND OF FAITHFUL PERFORMANCE

Bid #: _____
Bond #: _____
Surety Rating: _____
NV License #: _____
Appt. Agent Countersigning - List below with address

KNOW ALL MEN BY THESE PRESENTS: That WHEREAS, the City of Sparks in the State of Nevada has awarded to (**CONTRACTOR NAME)** hereinafter designated as the "Principal" a contract for Bid # **BID NUMBER**, PWP # **PWP NUMBER**, for the **PROJECT TITLE** and

WHEREAS, said Principal is required under the terms of said contract to furnish a bond for the faithful and proper performance of the Contract and the Bonding Company has an "A" or better rating with Moody's or A.M. Best and T-Listed with the U.S. Treasury Department;

NOW, THEREFORE, we the Principal and _____ as Surety, are held and firmly bound unto the City of Sparks in the State of Nevada, in the penal sum of (**WRITTEN COST)** dollars ($_____), lawful money of the United States, being not less than one hundred percent (100%) of the estimated contract cost of the work, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the above bound Principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions and agreements in the said contract and any alterations made as therein provided on his or their part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City of Sparks in the State of Nevada, its officers and agents as therein stipulated, then this obligation shall become null and void; otherwise, it shall be and remain in full force and virtue.

As a condition precedent to the satisfactory completion of the said contract, the above obligation shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time, if the above bounden principal, his or its heirs, executors, administrators, successors or assigns shall fail to make full, complete and satisfactory repair and replacements or totally protect the said City of Sparks in the State of Nevada from loss or damage made evident during said period of one (1) year from the date of acceptance of said works, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the obligation in the said sum of (**WRITTEN COST)** dollars ($_____) shall remain in full force and virtue; otherwise the above obligation shall be void.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in anyway effect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract, to the work or to the specifications.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their seals this _____ day of _____, 20___, the name and corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
_____
_____
Principal

By _____
_____
_____
_____
Surety
By _____

CITY OF SPARKS, NEVADA – Payment Bond – Labor & Materials

Bid #: _____
Bond #: _____
Surety Rating: _____
NV License #: _____
Appt. Agent Countersigning - List below with address

KNOW ALL MEN BY THESE PRESENTS: That WHEREAS, the City of Sparks in the State of Nevada, has awarded to **CONTRACTOR**, hereinafter designated as the "Principal" a Contract for Bid # **BID NUMBER**, PWP # **PWP NUMBER**, for the **PROJECT TITLE** and

WHEREAS, said Principal is required under the terms of said contract to furnish a Bond for the faithful and proper performance of the Contract and the Bonding Company has an "A" or better rating with Moody's or A.M. Best and T-Listed with the U.S. Treasury Department;

NOW, THEREFORE, we, the Principal, and _____ as Surety, are held and firmly bound unto the City of Sparks in the State of Nevada, in the penal sum of **WRITTEN AMOUNT** dollars ($_____), lawful money of the United States, being not less than one hundred percent (100%) of the estimated contract cost of the work for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally firmly by these presents.

NOW, THEREFORE, THE CONDITION OF THIS OBLICATION IS SUCH that if the above bounden principal, his or its heirs, executors, administrators, successors, or assigns, shall fail to pay for any materials, provisions, provender or other supplies, implements, or machinery used in, upon, for, or about the performance of the work contracted to be done or for any work or labor thereon of any kind, or for amounts due under the Unemployment Compensation Law with respect to such work or labor as required by the provisions of NRS 612, and provided that the claimant shall have complied with the provisions of said law, the Surety hereon will pay for the same within thirty (30) calendar days an amount not exceeding the sum specified in this bond, then the above obligation shall be null and void; otherwise to remain in full force and account. In case suit is brought upon this bond, the said Surety agrees to pay a reasonable attorney's fees to be fixed by the Court.

The Bond shall insure to the benefit of any and all persons, companies and corporations entitled to file claims under NRS 339 as to give a right of action to them or their assigns in any suit brought upon this Bond.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their seals this _____ day of _____, 20___, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
_____
_____
Principal

By _____

_____
_____
_____
Surety

By _____