

BID FOR
GERP RESTROOM AND STORAGE BUILDING

BID # 14/15-001

PWP # WA-2014-224

BIDS DUE NOT LATER THAN: 1:45 PM ON JUNE 11, 2014

PUBLIC BID OPENING: 2:00 PM ON JUNE 11, 2104

[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
GERP RESTROOM AND STORAGE BUILDING
BID #14/15-001 / PWP #WA-2014-224**

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 JUNE 11, 2014**. 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 JUNE 11, 2014**, at Sparks City Hall, 431 Prater Way Sparks, NV 89431.

PROJECT DESCRIPTION: Construction of a masonry building that will provide restroom facilities and two storage facilities at the Golden Eagle Regional Park Little League Fields, 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 be held on Friday, May 28, 2014 at 10:00 AM. Contractors should meet at the job site, in front of the soccer/multi-use fields at Golden Eagle Regional Park (first left after entering the park from Vista Blvd.), 6400 Vista 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: May 21, 2014
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. _____ **NEW:** “Certificate of Eligibility” Concerning Use of Local Preference, if Contractor wishes to potentially apply their preference.
7. _____ Bid Bond
8. _____ Signed Bid Addenda (if applicable)

**CITY OF SPARKS
 BID ITEM SCHEDULE**

BID TITLE: GERP Restroom and Storage Building

BID #14/15-001 / PWP-WA-2014-224

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 and storage facility per the plans and bid specifications complete and in place per lump sum.	\$ _____ /LS	\$ _____
2.0	1	LS	Force Account	\$ <u>20,000</u> /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:		
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 **GERP Restroom and Storage Building, Bid # 14/15-001**, 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 _____, 2014.

State of Nevada)

County of _____) SS.
)

On this _____ day of _____, in the year 2014, 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
RESPONSIBILITY 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 **GERP Restroom and Storage Building (Bid #14/15-001)** 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 # **14/15-001**, PWP # **WA-2014-224**, for the **GERP Restroom and Storage Building**.

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



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 **GERP Restroom and Storage Building**, 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.

General Conditions



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

General Conditions



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/pwpw.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.)):

General Conditions



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.

General Conditions



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

General Conditions



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 12/04 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.

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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 10/01, CA 00 05, CA 00 12 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 02/99 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 10/01.

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.

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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 04/92 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.

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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.

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- (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

General Conditions



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).

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- (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.

General Conditions



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.

General Conditions



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
GERP RESTROOM AND STORAGE BUILDING
Bid #14/15-001 / PWP# WA-2014-224

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 and two storage facilities at the Golden Eagle Regional Park Little League Fields, 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. 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 one hundred twenty (120) 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:

- FIVE HUNDRED DOLLARS (\$500.00) for each and every calendar day delay after the one hundred twenty (120) 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
3 rd Monday in January	Martin Luther King, Jr.'s Birthday
3 rd Monday in February	President's Day
Last Monday in May	Memorial Day
July 4	Independence Day
1 st Monday in September	Labor Day
Last Friday in October	Nevada Day
November 11	Veteran's Day
4 th Thursday in November	Thanksgiving Day
4 th 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 RESPONSIBILITY, 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.

END OF SPECIAL PROVISIONS



Project Manual

Plan Review/Bid Documents

Golden Eagle Little League Fields Expansion Restroom and Storage Building

Bid # 14/15-001
PWP # WA-2014-224
May 1, 2014

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

May 1, 2014

OWNER

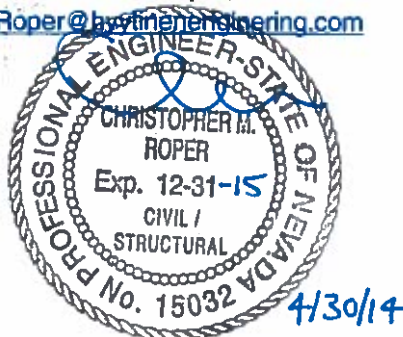
City of Sparks
431 Prater Way
Sparks, NV 89431
(775) 353-4083
(775) 353-1635 (fax)
Contact: Brian D. Cason, S.E., P.E.
Email: bcason@cityofsparks.us

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

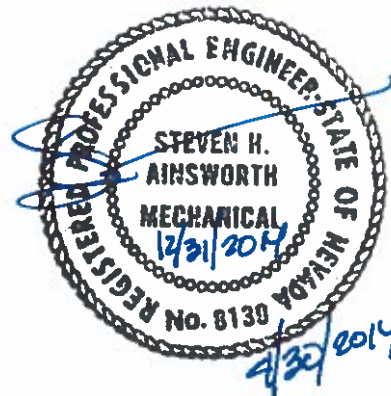
STRUCTURAL ENGINEERING

Hyytinen Engineering
5458 Longley Lane, Suite B
Reno, NV 89511
(775) 826-3019
(775) 826-3076 (fax)
Contact: Chris Roper, SE
Email: CRoper@hyytinenengineering.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



ELECTRICAL ENGINEERING

JP Engineering
10597 Double R Blvd. #1
Reno, NV 89521
(775) 852-2337
(775) 852-2352 (fax)
Contact: James Solaro, PE
Email: James@jpengnv.com

SECTION 00 00 01 – PROJECT DIRECTORY

May 1, 2014

CIVIL

Odyssey Engineering, Inc.
895 Roberta Lane, Suite 104
Sparks, NV 89431
(775) 359-3303
(775) 359-3329 (fax)
Contact: Ryan T. Sims, P.E.
Email: ryan@odysseyreno.com



SECTION 00010 - PROJECT SPECIFICATIONS INDEX

DIVISION 1	GENERAL REQUIREMENTS
013300	Submittal Procedures
DIVISION 2	SITEWORK
023119	Decorative Fences and Gates
DIVISION 3	CONCRETE
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032000	Concrete Reinforcement
033000	Cast-in-Place Concrete
033450	Concrete Finishing
033066	Concrete Stains
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042200	Concrete Unit Masonry
DIVISION 5	METALS
	Not Used
DIVISION 6	WOOD AND PLASTICS
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061900	Wood Trusses
066400	Plastic Paneling
DIVISION 7	THERMAL AND MOISTURE PROTECTION
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074113	Metal Roof Panels
079200	Joint Sealants
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087100	Door Hardware
088000	Glazing
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099300	Wood Stain & Transparent Finishes
099600	Anti-Graffiti Coatings

DIVISION 10 SPECIALTIES

- 101423 Building Signage
- 102113 Toilet Compartments
- 102800 Toilet and Bath Accessories
- 104413 Fire Extinguisher Cabinets
- 104416 Fire Extinguishers

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Not Used

DIVISION 12 FURNISHINGS

Not Used

DIVISION 13 SPECIAL CONSTRUCTION

Not used

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Not used

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- 15010 Basic Mechanical Requirements
- 15030 Electrical Requirements for Mechanical Equipment
- 15050 Basic Mechanical Materials and Methods
- 15150 Valves and Cocks
- 15250 Insulation
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- 15855 Equipment
- 15890 Ductwork
- 15932 Air Inlets & Outlets
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DIVISION 16 ELECTRICAL

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- 220000 Plumbing
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- 230000 Heating, Ventilating, and Air-Conditioning (HVAC)
- 230500 Common Work Results for HVAC
- 230593 Test and Balance
- 230700 HVAC Insulation
- 230800 HVAC Commissioning
- 230923 Direct Digital Controls
- 233100 HVAC Ducts and Casings
- 233700 Air Inlets and Outlets
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DIVISION 31 EARTHWORK

- 312099 Structural Earthwork

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- 323100 Rough Grading and Site Earthwork
- 325100 Water Systems
- 326000 Sewage and Drainage
- 327200 Aggregate Base Course
- 327500 Portland Cement Concrete Site Pavement

END OF SECTION

SECTION 01 23 00 - ALTERNATES

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 alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Rain Gutters/Down Spouts and Splash Blocks.
 - 1. Alternate No. 1: Shall include Rain Gutters, Down Spouts, and Slash Blocks as shown in the Drawings.

END OF SECTION 01 23 00

SECTION 01 33 00 - 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. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings 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. 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 enough 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 7 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 7 days for review of each resubmittal.

- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
 - g. Number and title of appropriate Specification Section.
 - h. Drawing number and detail references, as appropriate.
 - i. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
- H. 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 "Reviewed, No Exceptions Noted."
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, and installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating "Resubmittal Not Required" taken by Architect.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Submit electronic submittals directly to extranet specifically established for Project.
- 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 printed 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 written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operation and maintenance manuals.
 - k. Compliance with specified referenced standards.
 - l. Testing by recognized testing agency.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
 4. Submit Product Data before or concurrent with Samples.
 5. Number of Copies: Submit six copies of Product Data, unless otherwise indicated. Architect, will return two copies. Mark up and retain one returned copy as a Project Record Document.
- 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. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Templates and patterns.
 - g. Schedules.
 - h. Design calculations.
 - i. Compliance with specified standards.
 - j. Notation of coordination requirements.
 - k. Notation of dimensions established by field measurement.
 - l. Relationship to adjoining construction clearly indicated.
 - m. Seal and signature of professional engineer if specified.
 - n. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit (email) Shop Drawings as .PDF files. If this is not possible, provide hard copy sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Other than .PDF submittals, submit five opaque copies of each submittal. Architect will retain three copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect, through Construction Manager, will return two Insert number copies.

a. Mark up and retain one returned copy as a Project Record Document.

F. 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.
4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect, will return one copies.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. 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. 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. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 1. Reviewed, No Exceptions Noted
 2. Reviewed, Exceptions Noted – No Resubmittal Required
 3. Reviewed, Exceptions Noted – Resubmittal Required
 4. Rejected – Resubmittal Required
- C. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 02 31 19 - DECORATIVE METAL FENCES AND GATES

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. Decorative metallic-coated-steel tubular picket fences.
 - 2. Swing gates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For gates. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Include diagrams for power, signal, and control wiring.
- C. Samples: For each fence material and for each color specified.
 - 1. Provide Samples 12 inches in length for linear materials.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

PART 2 - PRODUCTS

2.1 DECORATIVE METALLIC-COATED-STEEL TUBULAR PICKET FENCES

- A. Decorative Metallic-Coated-Steel Tubular Picket Fences: Comply with ASTM F 2408 for industrial application (class) unless otherwise indicated.
 - 1. Basis-of-Design: Subject to compliance with requirements, provide Betafence USA's Summit 2 rail style or comparable product by one of the following:
 - a. Ameristar Fence Products

- B. Posts:
 - 1. End and Corner Posts: Square tubes 3 by 3 inches formed from 0.108-inch nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.
 - 2. Posts at Swing Gate Openings: Square tubes 3 by 3 inches formed from 0.108-inch nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.
- C. Post Caps: Formed from steel sheet and hot-dip galvanized after forming.
- D. Rails: Square tubes.
- E. Pickets: Square tubes.
 - 1. Extend pickets beyond top rail as indicated and terminate with galvanized-steel caps.
 - 2. Picket Spacing: 4 inches clear, maximum.
- F. Fasteners: Manufacturer's standard tamperproof, corrosion-resistant, color-coated fasteners matching fence components.
- G. Metallic-Coated Steel Sheet: Galvanized-steel sheet or aluminum-zinc, alloy-coated steel sheet.
- H. Galvanizing: For components indicated to be galvanized and for which galvanized coating is not specified in ASTM F 2408, hot-dip galvanize to comply with ASTM A 123/A 123M. For hardware items, hot-dip galvanize to comply with ASTM A 153/A 153M.
- I. Finish: Powder coating.

2.2 SWING GATES

- A. Gate Configuration: Double leaf.
- B. Gate Frame Height: As indicated.
- C. Gate Opening Width: As indicated.
- D. Galvanized-Steel Frames and Bracing: Fabricate members from square tubes 2 by 2 inches formed from 0.108-inch nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.
- E. Frame Corner Construction: Welded.
- F. Additional Rails: Provide as indicated, complying with requirements for fence rails.
- G. Infill: Comply with requirements for adjacent fence.
- H. Picket Size, Configuration, and Spacing: Comply with requirements for adjacent fence.
- I. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf more than **5 feet** wide. Provide cane bolts for pairs of gates. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

- J. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
 - 1. Function: 39 - Full surface, triple weight, antifriction bearing.
 - 2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.
- K. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from 3/4-inch- diameter, round steel bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to receive cane bolts in closed position.
- L. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A 123/A 123M. For hardware items, hot-dip galvanize to comply with ASTM A 153/A 153M.

2.3 STEEL AND IRON

- A. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.
- C. Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- D. Bar Grating: NAAMM MBG 531.
 - 1. Bars: Hot-rolled steel strip, ASTM A 1011/A 1011M, Commercial Steel, Type B.
 - 2. Wire Rods: **ASTM A 510**.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.5 METALLIC-COATED-STEEL FINISHES

- A. Galvanized Finish: Clean welds, mechanical connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.
- C. Powder Coating: Immediately after cleaning and pretreating, apply two-coat finish consisting of zinc-rich epoxy prime coat and TGIC polyester topcoat, with a minimum dry film thickness of **2** mils for topcoat. Comply with coating manufacturer's written instructions to achieve a minimum total dry film thickness of 4 mils.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.
 - 2. Comply with surface finish testing requirements in ASTM F 2408.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.
- B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of **500 feet** or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.
 - 1. Construction layout and field engineering are specified in Section 01 73 00 "Execution."

3.3 DECORATIVE FENCE INSTALLATION

- A. Install fences according to manufacturer's written instructions.
- B. Install fences by setting posts as indicated and fastening rails and infill panels to posts.
- C. Post Setting: Set posts with mechanical anchors at indicated spacing as indicated.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Space posts uniformly at 8 feet o.c.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.5 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

END OF SECTION 02 31 19

SECTION 03 10 00 - 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 1, "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 03 20 00: Concrete reinforcement.
2. Section 03 30 00: 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 1, "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 $\frac{3}{4}$ " 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 $\frac{3}{4}$ " 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, $\frac{3}{4}$ x $\frac{3}{4}$ 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, $\frac{1}{2}$ " thick by depth of slab less $\frac{1}{4}$ ", 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 03300.

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 $\frac{1}{4}$ " from a straight line measured between first and last tie along any line, and no more than $\frac{1}{4}$ " 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 $\frac{3}{4}$ " x $\frac{3}{4}$ " 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 Paragraph 1906.4 of the International Building Code and as specified herein. Located where indicated or otherwise required and approved as to not impair strength of structure.
 - b. Provide nominal 3/4" 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 $\frac{1}{4}$ ", and fill with joint sealer as specified in Section 03300, 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 $\frac{1}{4}$ ", and fill with joint sealer as specified in Section 03300, 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 03 30 00.
 - c. For interior work, build control strips into forms or diamond-saw cut joints $\frac{1}{8}$ " wide by $\frac{1}{5}$ 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 03300.
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 03 10 00

SECTION 03 20 00 - 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 1, "General Requirements" Sections, apply to the work specified in this Section.
- B. Related work:
 - 1. Section 03 10 00: Concrete formwork.
 - 2. Section 03 30 00: Cast-in-place concrete.
 - 3. Section 04 22 00: 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, $F_y=65$ 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 $\frac{1}{2}$ " to $\frac{3}{4}$ ".
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 $\frac{3}{4}$ " 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:

<u>Bar Size</u>	<u>Minimum Diameter</u>
#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, Par. 7.4 and IBC, Section 1907.

C. Placing & Fastening Reinforcement:

1. General:
 - a. Conform to IBC, Section 1907.5.
 - b. Prevent water from softening soil under reinforcing during steel placing.
 - c. Conform to ACI 318, Par. 7.5 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, Par. 7.6 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, Par. 7.12 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, Par. 7.7.

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 03 20 00

SECTION 03 30 00 - 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 03 10 00: Concrete formwork.
2. Section 03 20 00: Concrete reinforcement.
3. Section 03 34 50: 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 301-2002) 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 03 34 50).
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 03100 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	1-1/2" aggregate:		1" aggregate:		3/4" aggregate:	
	Min:	Max:	Min:	Max:	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, thiocyanates 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. Curing and Sealing Compound: (Meeting ASTM C-309 and ASTM C-1315) The 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. 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. Manufacturer's Certification required. (Sodium Silicate Compounds are prohibited.)
- C. Dissipating Resin Curing Compound: (Meeting ASTM C-309) The compound shall be a dissipating resin type compound, "Kurez DR" by The Euclid Chemical Co., "Vulkem 2100" by Mameco International, "Sealtight 3100" by W.R. Meadows, or approved equal. The film must chemically break down in a two-to-four week period. (To be used where a dissipating curing compound is required.)

- D. 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.
- E. 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.
- F. 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.
- G. 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.
- H. 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.
- I. 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.
- J. 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.
- K. Evaporation Retarder: The compound shall be "SikaFilm" by Sika Corporation, "Confilm" by Master Builders, or "Eucobar" by Euclid Chemical Company.
- L. Joint Sealant: Shall be "Eucolastic I" by The Euclid Chemical Company, or "SikaFlex Ia" 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.
- M. 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.
- N. V.O.C. Curing and Sealing Compounds: When curing and sealing compounds must meet V.O.C. regulations (or under such conditions where proper ventilation for safety is not possible), the curing and sealing compounds shall meet ASTM C-309 and shall be "Sealtight Vocomp 25" water-base acrylic cure and sealing compound by W.R. Meadows, or approved equal. Dissipating resin curing compounds shall be "Sealtight 1100" by W.R. Meadows, or approved equal. All curing and sealing compounds shall be coordinated with any floor coverings to insure that no conflict exists with the required adhesives.

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, Section 3.9. 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, Section 4.3 or ACI-301, Section 3.9.
- 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 <u>Location</u>	Req'd 28 day Compressive <u>Strength</u>	Maximum Water <u>Cement Ratio</u>	<u>Air Content</u>
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, Chapters 7 and 8.
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 for mechanical and electrical work, sizes and locations as shown as directed by cognizant trades.

3.2 INSTALLATION OF FORMWORK

- A. In accordance with Section 03 10 00.

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 03 34 50 of these Specifications.
- D. Cure and protect concrete in accordance with pertinent provisions of Section 03 34 50 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 waiver 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 03 30 00

SECTION 033066 – CONCRETE STAIN

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chemical Stain for Concrete Floors.
- B. Related Sections:
 - 1. Cast in Place Concrete: Elsewhere in division 3.
 - 2. Joint Sealers: Division 9.

1.2 REFERENCES (Not Used)

1.3 SUBMITTALS

- A. Product Data: Submit required copies of manufacturer's specifications, installation instructions, and general recommendations for 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.
 - 3. MSDS sheets.
- C. Maintenance Data: Submit manufacturer's instructions for proper maintenance materials and procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain chemical stain from a single approved manufacturer. Provide secondary materials as recommended by manufacturer of primary materials. Manufacturer shall have five years proven built project experience within the northern Nevada area, and shall have produced the chemical stain products proposed for the project, a minimum of 3 years.
- B. Installer Qualifications: A company approved or licensed by chemical stain manufacturer and which has five years applied experience with chemical concrete staining similar to the type included in this section.
 - 1. The job foreman shall have three years experience and shall be on the job site at all times chemical staining is being conducted.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in factory packages, marked with manufacturer and product name and location of installation.
- B. Store materials in dry area maintained at building's operating temperature and humidity.
- C. Follow manufacturer's instructions to prevent damage.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

A. Design is based on products by:

L.M. Scofield Company
6533 Bandini Blvd.
Los Angeles, California 90040
Phone: (213) 720-3000
FAX: (213) 720-3030

B. Color to be selected by Architect from manufacturer's full line.

2.2 PRODUCTS:

- A. Lithochrome Chemstain: an acidic, water based solution of metallic salts that penetrate and react with chemicals in cured concrete to produce insoluble color deposits in the pores. Each color is produced from different, complex formulations containing no pigments or resins.
- B. Cementone Clear Sealer: a water-borne, modified methyl-methacrylate emulsion. Its viscosity is optimized for surface penetration, leveling ability and ease of application by airless sprayer without thinning. Complies with all applicable air quality management regulations including those restricting VOC content to less than 350 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine concrete floor to verify that it has been finished with a uniform slip-resistant surface.
- B. Newly placed concrete should be sufficiently cured to allow the concrete to become reactive, a minimum of 14 days.

3.2 PREPARATION

- A. Surrounding areas, adjacent surfaces and finishes should be protected. The work area should be roped off, and appropriate sections closed to traffic.
- B. Before chemically staining the concrete surface, all dirt, form oil, plaster stains, oil, and grease must be completely removed by cleaning. Coating, water repellents, previously applied adhesives, and curing membranes must be removed by sandblasting, though small spots of paint may be removed with a scraper and a commercial paint stripper. Acid washing should normally not be used as a cleaning procedure, since it removes necessary reactants from the surface.

3.3 TEST SECTION

- A. Provide a test section 6 feet x 6 feet minimum in one of the toilet rooms. Test section should be produced by the same workers who will apply the Lithochrome Chemstain and Cementone Clear Sealer using the chosen color(s), application equipment, and techniques.

3.3 APPLICATION

- 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. Lithochrome Chemstain: Make two (2) applications to color uncolored concrete. Comply with manufacturer's instructions for application.
- C. Cementone Clear Sealer: Make two (2) applications to concrete. Comply with manufacturer's instructions for application.

3.3 CLEANING

- A. Upon completion, clean all surfaces which have become soiled as a result of work of this section, using proper methods which will not scratch or otherwise damage finished surfaces. Comply with manufacturer's instructions for cleaning methods.

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.

END OF SECTION

SECTION 03 34 50 - 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 1, "General Requirements" Sections, apply to the work specified in this Section.

B. Related work:

1. Section 03 30 00: 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 03 30 00 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 03 30 00 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 03 30 00, 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 Compounds & Protection Paper for Curing Interior Slabs
 - 1. For Recessed Slab Surfaces to Receive Tile Setting Bed: Furnish 6 mil clear visqueen or reinforced waterproof kraft paper conforming to ASTM C171, Type I; liquid membrane-forming curing compound shall not be used for curing interior recessed slabs.
 - 2. For Slabs to Receive Floor Coverings: Furnish clear liquid curing compound, compatible with respective floor covering adhesives; W. R. Meadows "SealTight Med-Cure" concrete curing compound, or equivalent, as approved. Curing compound shall be fully compatible with all resilient flooring and carpet adhesives which will be used on the Project and guaranteed by the manufacturer, in writing, not to impair bonding adhesive.
 - 3. 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.
- D. Sealer
 - 1. For interior slabs to receive sealed finish furnish acrylic polymer, water-based sealer conforming to ASTM C1315, Type I, Class A, non-yellowing; W. R. Meadows "VOCOMP-25", or approved equivalent.

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 Exposed 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 $\pm 1/2"$ 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: FF defines the maximum floor curvature allowed over 24 in. computed on the basis of successive 12 in. (300 mm) elevation differentials, FF is commonly referred to as the "Flatness F-Number".

$$FF = \frac{\text{Maximum difference in elevation, in decimals of inches, between successive 12" elevation differences.}}{4.57}$$

FL defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 ft. (3.5 m) distance. FL is commonly referred to as the "levelness F-Number".

$$FL = \frac{\text{Maximum difference in elevation, in decimals in inches, between two points separated by 10 ft.}}{12.5}$$

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 FF 20/FL 17 tolerance.

Unless otherwise noted, all troweled slabs shall achieve an FF 35 (Differences in elevation in successive 12 in. measurements shall not exceed 0.131 in.) / FL 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 detrimental to the service and Architectural qualities needed for the final slab finish, the Contractor 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 troweled finish for all floors to receive resilient floor coverings and carpeting.
 - b. Furnish smooth troweled finish for all interior floors to remain as walking surfaces and which are scheduled in Room Finish Schedule to receive sealed finish.
 - c. Furnish smooth troweled finish for all exterior equipment pads, dumpster pads, and the like.
 - d. Furnish broomed float finish for interior recessed slabs to receive ceramic floor tile finishes and associated setting beds.
 - e. Furnish exposed aggregate finish of portions of exterior walks as indicated on Architectural and Landscape Drawings.

- f. 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.
 - g. Furnish "tactile" diamond pattern finish, in addition to broom finish, at handicap ramp curb cut slab areas indicated to receive "tactile warning surface".
 - h. 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. At slab-on-grade floor areas scheduled to receive tile flooring and associated mortar setting bed, recess slabs 2"; slope recessed slabs in these areas to allow for uniform thickness of tile setting bed material.
 5. 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 1/4".

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 1/4", 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 Interior Slabs:

1. For Recessed Slab Surfaces: Install appropriate sheeting as specified above, installed over slabs immediately upon completion of surface finish work as work proceeds. Lap 3 inches and tape or otherwise seal edges and hold down by adequate means to prevent dislodgment. Maintain covering for a minimum of seven (7) days. Repair any damage to membrane which allows escape of slab moisture. Maintain membrane upkeep until full removal.
2. For Slabs to Receive Resilient and Carpet Floor Coverings:
 - a. Spray new slab surfaces with liquid curing compound specified above, applied at not less than the manufacturer's specified and recommended rate and in accordance with manufacturer's written instructions.
 - b. In addition, all floor slabs shall be covered with blankets for a minimum of 72 hours after pouring.
3. 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. In addition, all floor slabs shall be covered with blankets for a minimum of 72 hours after pouring.
- c. 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.

3.5 APPLIED FINISHES

A. Sealed Finish: Where sealed finish is scheduled

- 1. Apply one coat acrylic polymer, water-based sealer conforming to ASTM C1315, Type I, Class A, non-yellowing; W. R. Meadows "VOCOMP-25", or approved.
- 2. Apply sealer strictly in accordance with the sealer manufacturer's written application instructions and recommendations, for a uniform, low gloss sheen finish.

END OF SECTION 03 34 50

SECTION 04 06 50 – 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 04 22 00.

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 04 22 00.

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 Type Average 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 04 06 50

SECTION 04 22 00 - 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 1, "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 03 20 00.
 - 3. Mortar and grout covered under Section 04 06 50.

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 Wall Coordination Drawings

1. Contractor shall be responsible for providing masonry wall coordination drawings for all concrete masonry unit walls. Drawings shall consist of wall elevations drawn to scale at not less than $\frac{1}{4}'' = 1'-0''$.
2. Wall elevations shall include dimensioned sizes and locations for all door, window, and mechanical openings and penetrations, beam and joist bearing pockets, ledger angles, embedded plate connections, and anchor bolts. All miscellaneous steel to be embedded in the masonry unit wall shall be referenced by shop drawing mark number or structural detail number.
3. Masonry wall coordination drawings shall be reviewed and approved by interfacing trades prior to submittal to the Architect. Shop drawings for masonry reinforcement shall be an 'overlay' of the masonry wall coordination drawings. 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:

<u>Linear Shrinkage, %</u>	<u>Moisture Content, Max, % of Total Absorption (Average of 3 Units)</u>
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 60. 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 03 20 00, 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 04065 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 03 20 00.
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 04065 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 04 22 00

SECTION 06 10 00 - 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 preservative 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. 12.3B.
 - 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 06 10 00

SECTION 06 19 00 - 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 1 of these Specifications.
 - 2. Section 06 10 00: 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 06 19 00

SECTION 06 64 00 - PLASTIC PANELING

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 glass-fiber reinforced plastic (FRP) wall paneling and trim accessories.

1.3 ACTION SUBMITTALS

- A. Samples for Initial Selection: For plastic paneling and trim accessories.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.
- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 200 or less.
 - 2. Smoke-Developed Index: 450 or less.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC SHEET PANELING

- A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319.
 - 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. Crane Composites, A Crane Company.
 - 1) Matrex GR
 - a) Color: Graphite Gray 998
 - b. Marlite.
 - 1) Symmetrix FRP
 - a) Color: C145-G44 Silver
- 2. Nominal Thickness: Not less than 0.075 inch.
 - 3. Surface Finish: Ceramic Tile Pattern.
 - 4. Color: As shown above.

2.2 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
 - 1. Color: To match panel color
- B. Exposed Fasteners: Nylon drive rivets recommended by panel manufacturer.
- C. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.
- D. Adhesive: As recommended by plastic paneling manufacturer.
- E. Sealant: Single-component, mildew-resistant, neutral-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, 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 PREPARATION

- A. Remove wallpaper, vinyl wall covering, loose or soluble paint, and other materials that might interfere with adhesive bond.
- B. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.
- C. Clean substrates of substances that could impair bond of adhesive, including oil, grease, dirt, and dust.

- D. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- E. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.
 - 1. Mark plumb lines on substrate at trim accessory locations for accurate installation.
 - 2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive.
- C. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.
- D. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- E. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 06 64 00

SECTION 07 21 00 - THERMAL INSULATION

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. This Section includes the following:
 - 1. Concealed building insulation.
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board Assemblies" for installation in wood-framed assemblies and Z-Furring of insulation specified by referencing this Section.
 - 2. Division 15 Section "Mechanical Insulation."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 FOAM-PLASTIC BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:
1. Available Manufacturers:
 - a. Dow Chemical Company.
 - b. Owens Corning.
 2. Type IV, 1.60 lb/cu. ft., unless otherwise indicated.

2.3 GLASS-FIBER BLANKET INSULATION

- A. Available Manufacturers:
1. CertainTeed Corporation.
 2. Johns Manville.
 3. Owens Corning.
- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- C. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft, foil-scrim, vapor-retarder membrane on 1 face.

2.4 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Eave Ventilation Troughs: Preformed, rigid fiberboard designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves. Install from Eave to Ridge.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Install mineral-fiber insulation in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures.

4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:

3.5 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.6 INSULATION SCHEDULE

- A. Insulation Type : extruded-polystyrene board insulation: 1.5" Thick - provide at perimeter below grade footing as shown on the Drawings.
- B. Insulation Type : extruded-polystyrene board insulation: 3" Thick - provide at all Exterior CMU Walls as shown on the Drawings.
- C. Insulation Type : Foil Faced, glass-fiber blanket insulation: 9.25" Thick – provide above ceiling in attic space as shown on Drawings.
- D. Insulation Type : Un-Faced, glass-fiber blanket insulation: 3.5" Thick – provide in interior wood stud walls as shown on Drawings.

END OF SECTION 07 21 00

SECTION 07 41 13 - 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exposed-fastener, lap-seam corrugated metal roof panels.
- B. Related Sections:
 - 1. Division 7 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight roofing system.

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at the following test-pressure difference:
 - 1. Test-Pressure Difference: Negative 1.57 lbf/sq. ft..
 - 2. Test-Pressure Difference: Positive and negative 1.57 lbf/sq. ft..
 - 3. Positive Preload Test-Pressure Difference: Greater than or equal to 15.0 lbf/sq. ft. and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference.
 - 4. Negative Preload Test-Pressure Difference: 50 percent of design wind-uplift-pressure difference.
- C. Water Penetration: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft..
 - 2. Test-Pressure Difference: 20 percent of positive design wind pressure, but not less than 6.24 lbf/sq. ft. and not more than 12.0 lbf/sq. ft..

3. Positive Preload Test-Pressure Difference: Greater than or equal to 15.0 lbf/sq. ft. and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference.
 4. Negative Preload Test-Pressure Difference: 50 percent of design wind-uplift-pressure difference.
- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
1. Uplift Rating: UL 90.
- F. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure as indicated on Drawings.
 2. Snow Loads: as indicated on drawings
 3. Deflection Limits: Metal roof panel assemblies shall withstand wind and snow loads with vertical deflections no greater than 1/180 of the span.
- G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- H. Thermal Performance: Provide insulated metal roof panel assemblies with thermal-resistance value (R-value) indicated when tested according to ASTM C 518.

1.5 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam and endlap joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):
 - a. Flashing and trim.
 - b. Gutters.
 - c. Downspouts.
- B. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
1. Metal Roof Panels: 12 inches (300 mm) long by actual panel width. Include fasteners, clips, battens, closures, and other metal roof panel accessories.

2. Trim and Closures: 12 inches (300 mm) long. Include fasteners and other exposed accessories.
3. Accessories: 12-inch- (300-mm-) long Samples for each type of accessory.

- C. Material Certificates: For thermal insulation, from manufacturer.
- D. Field quality-control reports.
- E. Warranties: Samples of special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- C. Source Limitations: Obtain each type of metal roof panels from single source from single manufacturer.
- D. Surface-Burning Characteristics: Provide metal roof panels having insulation core material with the following surface-burning characteristics as determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.
- E. Fire-Resistance Ratings: Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
 2. Combustion Characteristics: ASTM E 136.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.9 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of purlins and rafters, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

- A. Steel: **Cor-ten AZP**
 - 1. Steel Sheet: Galvalume Min. 24 gauge, 32" panel coverage , 7/8" rib height
 - 2. Surface: Prepainted PVDF paintsystem by Duracoat
 - 3. Finish: Manufacturer's standard to match other adjacent structures within GERP.
 - 4. 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.
- B. Panel Sealants:
 - 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, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.2 FIELD-INSTALLED THERMAL INSULATION

- A. Refer to Division 7 Section "Building Insulation."

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: 30 to 40 mils thick minimum, consisting of slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. 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 one of the following:
 - a. Carlisle Coatings & Waterproofing Inc., Div. of Carlisle Companies Inc.; CCW WIP 300HT.
 - b. Grace Construction Products; a unit of Grace, W. R. & Co.; Ultra.
 - c. Henry Company; Blueskin PE200 HT.
 - d. Metal-Fab Manufacturing, LLC; MetShield.
 - e. Owens Corning; WeatherLock Metal High Temperature Underlayment.
- B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.

2.4 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, 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 EXPOSED-FASTENER, LAP-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
- B. Corrugated-Profile, Exposed-Fastener Metal Roof Panels: Formed with alternating curved ribs spaced at 2.67 inches o.c. across width of panel.
1. Material: 24 gauge (min.) Galvalume steel
 - a. Exterior Finish: Smooth
 2. Color: Cor-ten AZP to match other adjacent structures within GERP.
 - a.
 3. Panel Coverage: 32"
 4. Panel Height: 7/8"

2.6 ACCESSORIES

- A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. **Match material and finish of metal roof panels unless otherwise indicated.**
1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof 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 roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Flashing and Trim: Formed from same material as roof panels. Provide flashing and trim 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 per Architect's recommendation.**

2.7 FABRICATION

- A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. 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. Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weathertight and minimize noise from movements within panel assembly.
- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the 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. End Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 3. End Seams for Other Than Aluminum: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 4. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 6. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
- B. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
- C. 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.
- D. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- E. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.

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 below, 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. Extend underlayment into gutter trough. Roll laps with roller. Cover underlayment within 14 days.

1. Roof perimeter for a distance up from eaves of 24 inches beyond interior wall line.
 2. Valleys, from lowest point to highest point, for a distance on each side of 18 inches. Overlap ends of sheets not less than 6 inches.
 3. Rake edges for a distance of 18 inches.
 4. Hips and ridges for a distance on each side of 12 inches.
 5. Roof to wall intersections for a distance from wall of 18 inches.
 6. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of 18 inches.
- B. Felt Underlayment: Apply at locations indicated below, in shingle fashion to shed water, and with lapped joints of not less than 2 inches.
1. Apply over entire roof surface.
- C. Install flashings to cover underlayment to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

3.4 METAL ROOF PANEL INSTALLATION, GENERAL

- A. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
- B. Thermal Movement. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
1. Point of Fixity: Fasten each panel along a single line of fixing located at ridge.
 2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
- C. Install metal roof panels as follows:
1. Commence metal roof panel installation and install minimum of 300 sq. ft. in presence of factory-authorized representative.
 2. Field cutting of metal panels by torch is not permitted.
 3. Locate and space fastenings in uniform vertical and horizontal alignment.
 4. Provide metal closures at rake edges rake walls and each side of ridge and hip caps.
 5. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
 6. Install ridge and hip caps as metal roof panel work proceeds.
 7. End Splices: Locate panel end splices over, but not attached to, structural supports. Stagger panel end splices to avoid a four-panel splice condition.
 8. Install metal flashing to allow moisture to run over and off metal roof panels.
- D. Fasteners:
1. Steel Roof Panels: Use fasteners matching panel color for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.

- E. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
 - 1. Coat back side of roof panels with bituminous coating where roof panels will contact wood, ferrous metal, or cementitious construction.
- F. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.
 - 1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

- A. Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
 - 1. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
 - 2. Lap ribbed or fluted sheets one full rib corrugation.
 - 3. Provide metal-backed neoprene or EPDM washers under heads of exposed fasteners bearing on weather side of metal roof panels.
 - 4. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 - 5. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 - 6. Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.
 - 7. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps, and on side laps of nesting-type panels; on side laps of corrugated nesting-type, ribbed, or fluted panels; and elsewhere as needed to make panels weatherproof to driving rains.
 - 8. At panel end splices, nest panels with minimum 6-inch end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

3.6 ACCESSORY INSTALLATION

- A. General: 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 roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

- B. 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 excessive oil canning, 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 to result in 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).
- C. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal roof 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.

3.8 FIELD QUALITY CONTROL

- A. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.
- B. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 13

SECTION 07 92 00 - JOINT SEALANTS

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. This Section includes joint sealants for the following applications, including those specified by reference to this Section:

1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints in unit masonry.
 - b. Joints between metal panels.
 - c. Joints between different materials listed above.
 - d. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - e. Other joints as indicated.
2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
 - d. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - f. Other joints as indicated.

- B. Related Sections include the following:

1. Division 8 Section "Glazing" for glazing sealants.
2. Division 9 Section "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
3. Division 9 Section "Ceramic Tile" for sealing tile joints.
4. Division 7 Section "Exterior Siding"

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- 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.
- C. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- D. Qualification Data: For Installer.
- E. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
 - 5. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

1.6 PROJECT 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. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, 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 sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Single-Component Neutral-Curing Silicone Sealant:
1. Available Products:
 - a. Sonneborn, Division of ChemRex Inc.; Omniseal.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 50.
 4. Use Related to Exposure: NT (nontraffic).
 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Coated glass, color anodic aluminum, galvanized steel and ceramic tile.
 6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
- C. Single-Component Neutral-Curing Silicone Sealant:
1. Available Products:
 - a. Dow Corning Corporation; 799.

- b. GE Silicones; UltraGlaze SSG4000.
- c. GE Silicones; UltraGlaze SSG4000AC.
- d. Tremco; Proglaze SG.
- e. Tremco; Spectrem 2.
- f. Tremco; Tremsil 600.

- 2. Type and Grade: S (single component) and NS (nonsag).
- 3. Class: 25.
- 4. Use Related to Exposure: NT (nontraffic).
- 5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Coated glass, color anodic aluminum, galvanized steel and ceramic tile.

2.4 LATEX JOINT SEALANTS

- A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.
- B. Available Products:
 - 1. Pecora Corporation; AC-20+.
 - 2. Sonneborn, Division of ChemRex Inc.; Sonolac.
 - 3. Tremco; Tremflex 834.

2.5 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are 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) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

2.6 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.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

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 joint-sealant performance.
- 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, blast cleaning, 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. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous 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. Glass.
 - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on 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.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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 type 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.

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 and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 08 11 13 - STEEL 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Standard hollow metal doors and frames.
- B. Related Sections:
 - 1. Division 8 Section "Door Hardware" for door hardware and weather stripping.
 - 2. Division 9 Section "Painting" for field painting factory-primed doors and frames.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.
- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door design.
 - 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 moldings, removable stops, and glazing.
 - 8. Details of conduit and preparations for power, signal, and control systems.
- C. Other Action Submittals:
 - 1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.
- B. Comply with ANSI A 250.8, unless more stringent requirements are indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to finish of 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 under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

- A. Coordinate installation of anchorages 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.

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. Amweld Building Products, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Curries Company; an Assa Abloy Group company.
 - 4. Steelcraft; an Ingersoll-Rand company.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A60 ZF180 metallic coating.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Powder-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.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
 - 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 - 3. Vertical Edges for Single-Acting Doors: Manufacturer's standard.
 - 4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick, end closures or channels of same material as face sheets.
 - 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
 - 1. Fabricate frames with fully welded corners.
 - 2. Frames for Level 3 Steel Doors: 0.067-inch- thick steel sheet.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

- D. Door Silencers: Except on weather-stripped frames, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.
- E. Supports and Anchors: Fabricated from not less than 0.042-inch- thick, electrolytic zinc-coated or metallic-coated steel sheet.
 - 1. Wall Anchors in Masonry Construction: 0.177-inch- diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.
- F. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153/A 153M, Class C or D as applicable.

2.5 ACCESSORIES

- A. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

2.6 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 thickness of metal. 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. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- D. 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. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. 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 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
- E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 8 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 Sections.

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. For the record, 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. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. 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 ANSI/SDI A250.11.

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. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - b. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - c. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
 2. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 3. 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 Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 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. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- D. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08 11 13

SECTION 08 31 13 - 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.
- B. Related Requirements:
 - 1. Division 07 Section "Roof Accessories" for roof hatches.

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, provide products by one of the following:
 - 1. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
 - 2. Larsen's Manufacturing Company.
 - 3. Milcor Inc.
- B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
- C. Flush Access Doors with Concealed Flanges:

1. Assembly Description: Fabricate door to fit flush to frame. Provide frame with gypsum board
2. Locations: Wall and ceiling as required.
3. Door Size: Minimum Size required to provided necessary access.
4. Uncoated Steel Sheet for Door: Nominal 0.060 inch, 16 gage.
 - a. Finish: Factory prime.
5. Frame Material: Same material and thickness as door.
6. Hinges: Manufacturer's standard.
7. Hardware: Latch.

D. Hardware:

1. Latch: Slam latch operated by screwdriver.

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. For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
 1. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

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.

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 08 31 13

SECTION 08 33 23 - OVERHEAD COILING DOORS

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:
 - 1. Overhead Coiling doors.
- B. Related Sections:

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
 - 1. Wind Loads:
 - a. Basic Wind Speed: 100 mph.
 - b. Exposure Category: C.
 - 2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
- B. Operability under Wind Load: Design overhead coiling doors to remain operable under uniform pressure (velocity pressure) of 20 lbf/sq. ft. wind load, acting inward and outward.
- C. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than 10,000 cycles. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.4 SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
 - 1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 - 2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
1. Curtain Slats: 12 inches long.
 2. Guides: 6 inches long.
- D. Qualification Data: For qualified Installer.
- E. Maintenance Data: For overhead coiling doors to include in maintenance manuals.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
1. Obtain operators and controls from overhead coiling door manufacturer.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 zinc coating; nominal sheet thickness (coated) of 0.028 inch and as required to meet requirements.
- B. Endlocks for Doors: Manufacturer's standard locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Doors: Manufacturer's standard continuous channel or tubular shape, fabricated from manufacturer's standard hot-dip galvanized steel, stainless steel, or aluminum extrusions to match curtain slats and finish.
- D. Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- E. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.

1. Removable Posts and Jamb Guides for Doors: Manufacturer's standard, Face of Wall mounted.

2.2 COILING DOORS

- A. Integral Frame, Hood, and Fascia for Door: Welded sheet metal assembly of the following sheet metal:
 1. Galvanized Steel: Nominal 0.064-inch- thick, hot-dip galvanized steel sheet with G90 zinc coating, complying with ASTM A 653/A 653M.

2.3 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side for doors & exterior side for service doors.
- B. Chain Lock Keeper: Suitable for padlock.

2.4 CURTAIN ACCESSORIES

- A. Weatherseals: Equip each exterior door with weather-stripping gaskets fitted to entire perimeter of door for a weathertight installation, unless otherwise indicated.
 1. At door head, use 1/8-inch- thick, replaceable, continuous sheet secured to inside of hood.
 2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch- thick seals of flexible vinyl, rubber, or neoprene.
- B. Push/Pull Handles:
 1. Equip each push-up-operated service door or emergency-operated door with lifting handles on each side of door, finished to match door.
 2. Provide pull-down straps or pole hooks for doors more than 84 inches high.

2.5 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.
- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.

- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.6 MANUAL DOOR OPERATORS

- A. Equip door with manufacturer's standard manual crank door operator.

2.7 DOOR ASSEMBLY

- A. Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Overhead Door corporation (Door – Series 627) or comparable product by one of the following:
 - a. AlumaTek, Inc.
 - b. C.H.I. Overhead Doors.
 - c. Cookson Company.
 - d. Raynor.
- B. Operation Cycles: Not less than 10,000.
- C. Door Curtain Material: Galvanized steel.
- D. Door Curtain Slats:
 - 1. Flat, Insulated, Type FIT-265.
- E. Insulation:
 - 1. Foamed-in-place, CFC and HCFC-free polyurethane
 - 2. R-Value: 10.0 ; U-factor 0.84
- F. Finish:
 - 1. PowderGuard Zinc Finish
 - 2. Color: To be Selected from manufacturer's available colors
 - 3. Warranty 4 Year Finish Warranty against fading, cracking, blistering, flaking, or peeling of the Zinc-rich Powder with Top Powder Finish for guides, bottom bar and head plates.
- G. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- H. Hood: Galvanized steel.
 - 1. Shape: Square
 - 2. Mounting: Face of wall.
 - 3. Finish: Factory Prime finish – manufacturer's standard color.
- I. Integral Frame, Hood, and Fascia: Galvanized steel.
 - 1. Mounting: Face of wall.

- J. Locking Devices: Equip door with slide bolt for padlock.
- K. Manual Door Operator: Chain operator.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. 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.

2.9 STEEL AND GALVANIZED-STEEL FINISHES

- A. Factory Prime Finish: Manufacturer's standard primer, compatible with field-applied finish. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Perform installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide weathertight fit around entire perimeter.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 08 33 23

SECTION 08 41 13 - ALUMINUM-FRAMED STOREFRONTS

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. Storefront framing for punched exterior openings.
- B. Related Sections:
 - 1. Division 08 Section "Glazing".

1.3 DEFINITIONS

- A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 - 2. Dimensional tolerances of building frame and other adjacent construction.
 - 3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Noise or vibration created by wind and by thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Sealant failure.
 - g. Failure of operating units.
- B. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Structural Loads:

1. Wind Loads:
 - a. Basic Wind Speed: 105 mph 3-second gust wind speed
 - b. Importance Factor: 1.15
 - c. Exposure Category: C.
 2. Seismic Loads: Seismic Site Class D
- D. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to L/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
- E. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.
- F. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of **0.06 cfm/sq. ft.** of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of **6.24 lbf/sq. ft.**
- G. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- H. Water Penetration under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
1. Maximum Water Leakage:
 2. No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior and water that cannot damage adjacent materials or finishes.
- I. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2. Interior Ambient-Air Temperature: 75 deg F (24 deg C).

- J. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.
- K. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than **0.69 Btu/sq. ft. x h x deg F** when tested according to AAMA 1503.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- D. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:

- a. Structural failures including, but not limited to, excessive deflection.
- b. Noise or vibration caused by thermal movements.
- c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- d. Water leakage through fixed glazing and framing areas.
- e. Failure of operating components.

- 2. Warranty Period: Five years from date of Substantial Completion.

- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.

- 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products from one of the following:

- 1. United States Aluminum.
 - a. Exterior Storefront System – IT 451 – 1" Glazing
 - b. 2" x 4-1/2"
- 2. Oldcastle Building Envelope Company.
 - a. Exterior Storefront System – FG6000 – 1" Glazing
 - b. 2" x 4-1/2"
- 2. Kawneer North America; an Alcoa company.
 - a. Exterior Storefront System = Trifab Versa Glaze 451T
 - b. 2"x 4-1/2"

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 - 4. Structural Profiles: ASTM B 308/B 308M.
 - 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

- B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Construction: Thermally broken.
 - 2. Glazing System: Retained mechanically with gaskets on four sides.
 - 3. Glazing Plane: As indicated.

- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.

- E. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

- F. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

2.4 GLAZING SYSTEMS

- A. Glazing: As specified in Division 08 Section "Glazing."

- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.5 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."
 - 1. Sealants used inside the weatherproofing system shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.762-mm) thickness per coat.

2.6 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 ALUMINUM FINISHES

- A. Color Anodized:
 - 1. Conforming to AA-M12C22A [34] [44] and AAMA 608.1.
 - 2. Architectural Class, etched, medium matte, black colored anodic coating AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, 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. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
 - 6. Seal joints watertight unless otherwise indicated.
- B. Metal Protection:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- D. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.
- E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.
- F. Install glazing as specified in Division 08 Section "Glazing."
- G. Install perimeter joint sealants as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.

3.3 ERECTION TOLERANCES

- A. Install aluminum-framed systems to comply with the following maximum erection tolerances:
 - 1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
 - 2. Alignment:
 - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm).

- b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).
- B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

END OF SECTION 08 41 13

SECTION 08 71 00 - DOOR HARDWARE

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. This Section includes the following:
 - 1. Commercial door hardware for the following:
 - a. Swinging doors.
- B. Related Sections include the following:
 - 1. Division 8 Section "Steel Doors and Frames" for door silencers provided as part of the frame.

1.3 SUBMITTALS

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1. Certificates: Submit Certificates of Compliance for all fire-rated openings under product data sheets. Include the installation instructions for all hardware installed on fire-rated openings.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
 - a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.

- e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.
- D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- D. Regulatory Requirements: Comply with provisions of the following:
- 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 - 2. NFPA 101: Comply with the following for means of egress doors:

- a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
- b. Door Closers: Not more than 30 lbf to set door in motion and not more than 15 lbf to open door to minimum required width.
- c. Thresholds: Not more than 1/2 inch high.

1.5 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 related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to Owner by registered mail or overnight package service.

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.7 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section, and the Door Hardware Schedule at the end of Part 3.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

2.2 HINGES AND PIVOTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Hinges:
 - a. Hagar.

B. Quantity: Provide the following, unless otherwise indicated:

1. Three Hinges: For doors with heights 61 to 90 inches.
2. Four Hinges: For doors with heights 91 to 120 inches.

C. Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight
36 by 84 by 1-3/4	4-1/2	0.134	0.180
48 by 120 by 1-3/4	5	0.146	0.190

D. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

E. Hinge Weight: Unless otherwise indicated, provide the following:

1. Entrance Doors: Heavy-weight hinges.
2. Doors with Closers: Antifriction-bearing hinges.
3. Interior Doors: Standard-weight hinges.

F. Hinge Base Metal: Unless otherwise indicated, provide the following:

1. Exterior Hinges: Stainless steel, with stainless-steel pin.
2. Interior Hinges: Brass, with stainless-steel pin body and brass protruding heads.
3. Hinges for Fire-Rated Assemblies: Stainless steel, with stainless-steel pin.

G. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:

1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - a. Outswinging exterior doors.
2. Corners: Square.

H. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.

4. Screws: Phillips flat-head screws; machine screws (drilled and tapped holes) for metal doors and wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.3 LOCKS AND LATCHES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Mechanical Locks and Latches:
 - a. Schlage Lock Company; an Ingersoll-Rand Company.
- B. Lock Trim: Comply with the following:
 1. Lever: Cast.
 2. Escutcheon (Rose): Wrought.
 3. Dummy Trim: Match lever lock trim and escutcheons.
 4. Lockset Designs: Provide the lockset design as indicated in Hardware Schedule.
- C. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 1. Bored Locks: Minimum 1/2-inch latchbolt throw.
 2. Mortise Locks: Minimum 3/4-inch latchbolt throw.
 3. Deadbolts: Minimum 1-inch bolt throw.
- D. Rabbeted Doors: Provide special rabbeted front and strike on locksets for rabbeted meeting stiles.
- E. Backset: 2-3/4 inches, unless otherwise indicated.

2.4 CYLINDERS AND KEYING

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Cylinders: Schlage. Classic "C" Keying System.
- B. Cylinders: Equip cylinders for interchangeable-core pin tumbler inserts. Furnish only temporary inserts for the construction period.
 1. Furnish final cores and keys for installation by Contractor.
- C. Construction Keying: Comply with the following:
 1. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
- D. Keying System: Unless otherwise indicated, provide a factory-registered keying system complying with the following requirements:

1. Grand Master Key System to the Owner's existing system, with a new masterkey for the Project.
2. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), new or integrated with Owner's existing system.
3. Comply with Owner's instructions for masterkeying and , except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.

E. Keys: Provide nickel-silver keys complying with the following:

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."
2. Quantity: In addition to one extra blank key for each lock, provide the following:
 - a. Cylinder Change Keys: Three.
 - b. Master Keys: Five.
 - c. Grand Master Keys: Five.
3. Keying: "C" series to match Owner's existing system.

2.5 STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Provide flat lip strikes for locks with 3-piece, antifriction latchbolts as recommended by manufacturer.
 2. Provide recess type top strikes for bolts locking into head frames, unless otherwise indicated.
 3. Provide dust-proof strikes for foot bolts, except where special threshold construction provides nonrecessed strike for bolt.

2.6 CLOSERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Surface-Mounted Closers:
 - a. LCN Closers; an Ingersoll-Rand Company.
- B. Size of Units: Unless otherwise indicated, 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.

2.7 STOPS AND HOLDERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Trimco.
- B. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch; fabricated for drilled-in application to frame.
 - 1. See Division 8 – ‘Steel Doors and Frames’ for number and location of silencers.

2.8 DOOR GASKETING

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Door Gasketing:
 - a. Pemko Manufacturing Co., Inc.
 - 2. Door Bottoms:
 - a. Pemko Manufacturing Co., Inc.
- B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
 - 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 2. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- C. 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.
- D. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke-labeled gasketing on smoke-labeled doors.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.

2.9 THRESHOLDS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Pemko Manufacturing Co., Inc.

2.10 DOOR TRIM UNITS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Trimco
- B. Fasteners – Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
- C. Fabricate protection plates not more than 1-1/2 inches less than door width on hinge side and not more than ½ inch less than door width on pull side.

2.11 FABRICATION

- A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.
 - 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal, 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 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. 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. Steel Machine or Wood Screws: For the following fire-rated applications:
 - a. Mortise hinges to doors.
 - b. Strike plates to frames.
 - c. Closers to doors and frames.
 - 3. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.12 FINISHES

- A. Standard: Comply with BHMA A156.18.
- 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 door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with DHI A115 series.
 - 1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.
- B. Wood Doors: Comply with DHI A115-W series.
- C. Certificates of Compliance for fire-rated hardware and installation instruction shall be made available upon request by the Authority having Jurisdiction.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- 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 specified in Division 9 Sections. 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. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

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. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Door Closers: Adjust sweep period 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.

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 door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DOOR HARDWARE SCHEDULE

GROUP H1

Exterior (Steel-Single)

Quan	Item	Description	Manufacturer
1	LOCKSET	ND94PD RHO 619 13-047	SCHLAGE
3	HINGES	BB1199 4.5x4.5 US15 NRP	HAGER
1	WEATHERSTRIP	PK55BL	PEMKO
1	DOOR BOTTOM	216APK	PEMKO
1	THRESHOLD	2748A	PEMKO
1	DOOR HOLDER	1220-5 619	TRIMCO
1	CLOSER	4041 Rw/PA AL	LCN
2	KICKPLATE	KOO50 12" high	TRIMCO

END OF SECTION 08 71 00

SECTION 08 80 00 - GLAZING

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. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Storefront Windows.

1.3 DEFINITIONS

- A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- D. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

- a. Specified Design Wind Loads: 100 mph, Exposure C
 - b. Maximum Lateral Deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch, whichever is less.
 - 1) For monolithic-glass lites heat treated to resist wind loads.
 - 2) For insulating glass.
 - c. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
- 1. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 - 2. Center-of-Glass Values: Based on using LBL-44789 WINDOW 5.0 computer program for the following methodologies:
 - a. U-Factors: NFRC 100 expressed as Btu/ sq. ft. x h x deg F.
 - b. Solar Heat Gain Coefficient: NFRC 200.
 - c. Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- square Samples for glass.
 - 1. Insulating glass for each designation indicated.
- C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.

- C. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.9 WARRANTY

- A. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. Product: Subject to compliance with requirements, provide product specified.
 - 3. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 GLASS PRODUCTS

- A. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of class indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, kind, and condition indicated.
 - 1. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
 - 2. For uncoated glass, comply with requirements for Condition A.
 - 3. For coated vision glass, comply with requirements for Condition C (other uncoated glass).
- C. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.
 - 1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
 - 2. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
 - 3. Sealing System: Dual seal, with primary and secondary sealants as follows:
 - a. Manufacturer's standard sealants.
 - 4. Spacer Specifications: Manufacturer's standard spacer material and construction.

2.3 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
 - 1. Neoprene, ASTM C 864.
 - 2. EPDM, ASTM C 864.
 - 3. Silicone, ASTM C 1115.
 - 4. Any material indicated above.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
 - 1. Neoprene.
 - 2. EPDM.
 - 3. Silicone.
 - 4. Any material indicated above.

2.4 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
 - 1. Type 1, for glazing applications in which tape acts as the primary sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.6 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.7 INSULATING-GLASS UNITS

- A. Glass Type **G4**: 1 inch sealed insulating units.
 - 1. Product: Pyrolytic Low-E Tinted Insulating Glass.
 - 2. Total thickness: 1 inch, nominal.
 - 3. Exterior pane: "Caribia" by PPG Industries, Inc.
 - 4. Interior pane: Clear, Pyrolytic Coated on Third Surface (3).
 - a. Coating: "Sungate" 500 Low-E (Pyrolytic) by PPG Industries, Inc.
 - b. Location: Third Surface (3)

5. Acceptable glazing methods:
 - a. Manufacturer's standard compression gaskets, both sides.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep system.
 3. Minimum required face or edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches as follows:
 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
 - G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
 - H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
 - I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
 - J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- 3.4 TAPE GLAZING
- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
 - B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
 - C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
 - D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
 - E. Do not remove release paper from tape until just before each glazing unit is installed.
 - F. Apply heel bead of elastomeric sealant.
 - G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
 - H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of

openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

- D. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00

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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Interior gypsum board.
- 2. Metal Z-Furring

- B. Related Sections include the following:

- 1. Division 6 Section "Rough Carpentry" for wood framing and furring that supports gypsum board.
- 2. Division 7 Section "Building Insulation" for insulation and vapor retarders installed in assemblies that incorporate gypsum board.
- 3. Division 9 painting Sections for primers applied to gypsum board surfaces.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Samples: For the following products:

- 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.
- 2. Textured Finishes: 24x24 inch for each textured finish indicated and on same backing indicated for Work.

1.4 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.5 PROJECT 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 interior products 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 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. G-P Gypsum.
 - b. National Gypsum Company.
 - c. PABCO Gypsum.
 - d. USG Corporation.
- B. Type X:
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.

2.3 WATER RESISTANT GYPSUM BOARD

- A. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. G-P Gypsum.
 - b. National Gypsum Company.
 - c. PABCO Gypsum.
 - d. USG Corporation.
 - 2. Core: 5/8 inch, Type X.
 - 3. Locations: Use at wet locations as required by local building code.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
 - 2. Shapes:
 - a. Cornerbead.
 - b. L-Bead: L-shaped; exposed long flange receives joint compound.

2.5 METAL FURRING CHANNELS

- A. Furring channels shall be 3 inch deep, 20 gauge, unless noted otherwise.
 - 1. Z-Furring shall be galvanized members with coating designation G60. Minimum base metal thickness of 0.0179 inch. Face flange of 1 ¼ inch and wall attachment flange of 7/8 inch. Depth as required to fit insulation thickness indicated.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: 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.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.7 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.

2.8 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, 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. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. 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 INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: As indicated on Drawings.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners, unless otherwise indicated.
 - 2. L-Bead: Use where indicated.

3.5 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, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 3: Where indicated on Drawings.

3.6 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture-free of starved spots or other evidence of thin application or of application patterns.
 1. Texture shall be "Light Knock Down Finish" or "Orange Peel".
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

3.7 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. 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 09 29 00

SECTION 09 30 00 - CERAMIC TILE

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. This Section includes the following:
 - 1. Wall Quarry Base Tile.

1.3 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Actual tile size (minor facial dimension as measured per ASTM C 499).
- C. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- C. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
- D. Material Test Reports: For each tile-setting and grouting product.

1.5 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tiles of same type and color or finish from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquid latexes and emulsion adhesives in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.
 - a. Wall Cove tile, Universal Cove tile (Earth Stone Gallery), # 20 black, 6"x12"

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified.
 - 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
 - 4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
 - 5. Basis-of-Design Product: The design for each tile type is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
 - 2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 - 1. Match Architect's samples.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
 - 1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 TILE PRODUCTS

- A. Manufacturers:
 - 1. Daltile
 - 2.
- B. Coved Wall Base Tile, as follows:
 - 1. Quarry Base Tile – P-3665
 - 2. Module Size: 6 x 6 inches.
 - 3. Thickness: 3/8 inch.
 - 4. Color: Gray

2.4 SETTING AND GROUTING MATERIALS

- A. Manufacturers:
 - 1. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. Custom Building Products.
 - b. MAPEI Corporation
 - c. Laticrete.

- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:
 - 1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
 - 2. Prepackaged dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive.
 - a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.
- C. Latex-Portland Cement Grout: One-component dry grout mix, field-mixed with water; or two-component, dry grout mix and liquid latex additive, field-mixed; complying with ANSI A118.6
 - 1. All components premeasured and prepackaged.
 - 2. Dry latex additive: Polyvinyl acetate or ethylene vinyl acetate.
 - 3. Liquid latex additive: Manufacturer's standard water emulsion.
 - 4. Mix in accordance with manufacturer's recommendations.

2.5 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."
 - 1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
 - 1. Products:
 - a. Dow Corning Corporation; Dow Corning 786.
 - b. GE Silicones; Sanitary 1700.
 - c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 - d. Tremco, Inc.; Tremsil 600 White.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.
 - 1. Products:
 - a. Bonsal, W. R., Company; Grout Sealer.
 - b. Bostik; CeramaSeal Grout Sealer.
 - c. C-Cure; Penetrating Sealer 978.
 - d. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
 - e. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
 - f. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
 - g. TEC Specialty Products Inc.; TA-256 Penetrating Silicone Grout Sealer.

2.6 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- F. Grout tile to comply with requirements of the following tile installation standards:
 - 1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.
 - 2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.
 - 3. For chemical-resistant furan grouts, comply with ANSI A108.8.

3.4 BASE TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.
- B. Install metal lath and scratch coat for walls to comply with ANSI A108.1A, Section 4.1.
- C. Joint Widths: Install tile on walls with the following joint widths:
 - 1. Glazed Base Tile: 1/16 inch.

3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect

metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.6 WALL TILE INSTALLATION SCHEDULE

- A. Wall Base Tile Installation: Interior wall installation over gypsum board; thin-set mortar; TCA W243 and ANSI A108.5.
1. Tile Type: Glazed wall base tile.
 2. Thin-Set Mortar: Latex- portland cement mortar.
 3. Grout: Standard unsanded cement grout.

END OF SECTION 09 30 00

SECTION 09 91 13 - EXTERIOR PAINTING

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. This Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Galvanized metal.
- B. Related Sections include the following:
 - 1. Division 9 Section "Interior Painting" for surface preparation and the application of paint systems on interior substrates.
 - 2. Division 9 Section "Wood Stains and Transparent Finishes" for surface preparation and the application of wood stains and transparent finishes on exterior wood substrates.

1.3 QUALITY ASSURANCE

- A. MPI Standards:
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
 - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.4 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.

1.5 PROJECT 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.

1.6 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 - 1. Quantity: Furnish 1 gal. of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Benjamin Moore & Co.
 - 2. ICI Paints.
 - 3. Kelly-Moore Paints.
 - 4. Sherwin-Williams Company (The).

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 indicated in a color & materials schedule.

2.3 METAL PRIMERS

- A. Cementitious Galvanized-Metal Primer: MPI #26.

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 work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating 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 and paint systems indicated.
- B. Remove plates, machined surfaces, and similar items already in place that 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.
 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds 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.
 1. Use applicators and techniques suited for paint and substrate indicated.
 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
- 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.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:

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 and Frames, Coiling Doors, Mechanical Louver)
 - 1. Acrylic System:
 - a. Prime Coat: DTM Acrylic-metal primer. (MPI 107)
 - b. Intermediate Coat: DTM Acrylic coating (Semi-gloss)
 - c. Topcoat: DTM Acrylic coating (Semi-gloss)

END OF SECTION 09 91 13

SECTION 0 99 123 - 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. This Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Steel.
 - 2. Galvanized metal.
 - 3. Gypsum board.
- B. Related Sections include the following:
 - 1. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
 - 2. Division 09 Section "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. 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. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

- A. MPI Standards:
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

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 PROJECT 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.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 1. Quantity: Furnish 1 gal. of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Benjamin Moore & Co.
 2. Dunn-Edwards Corporation.
 3. ICI Paints.
 4. Kelly-Moore Paints.
 5. Sherwin-Williams Company (The).

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 indicated in color & material schedule

2.3 PRIMERS/SEALERS

- A. Interior Latex Primer/Sealer
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.

2.4 METAL PRIMERS

- A. Quick-Drying Alkyd Metal Primer
 - 1. VOC Content: E Range of E1.
- B. Cementitious Galvanized-Metal Primer
 - 1. VOC Content: E Range of E1.
- C. Quick-Drying Primer for Aluminum
 - 1. VOC Content: E Range of E1.

2.5 LATEX PAINTS

- A. Interior Latex (Flat): (Gloss Level 1).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.5.
- B. Interior Latex (Low Sheen): (Gloss Level 2).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.
- C. Interior Latex (Eggshell): (Gloss Level 3).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.
- D. Interior Latex (Satin): (Gloss Level 4).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 2.
- E. Interior Latex (Semigloss): (Gloss Level 5).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 2.

2.6 QUICK-DRYING ENAMELS

- A. Quick-Drying Enamel (Semigloss): (Gloss Level 5).
 - 1. VOC Content: E Range of E1.

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 work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Gypsum Board: 12 percent.
 - 5. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 1. Beginning coating 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 plates, machined surfaces, and similar items already in place that 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.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

- E. Clay Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content of surfaces or alkalinity of mortar joints to be painted exceed that permitted in manufacturer's written instructions.
- F. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- G. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- H. 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.
- I. Aluminum Substrates: Remove surface oxidation.
- J. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- K. Spray-Textured Ceiling Substrates: Do not begin paint application until surfaces are dry.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- 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 Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:
 - 1. Mechanical Work:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Tanks that do not have factory-applied final finishes.

- e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
- f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
- g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

2. Electrical Work:

- a. Switchgear.
- b. Panelboards.
- c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:

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. Steel Substrates:

1. Quick-Drying Enamel System:

- a. Prime Coat: Quick-drying alkyd metal primer.
- b. Intermediate Coat: Quick-drying enamel matching topcoat.
- c. Topcoat: Quick-drying enamel (semigloss).

B. Galvanized-Metal Substrates:

1. Latex System:

- a. Prime Coat: Cementitious galvanized-metal primer.
- b. Intermediate Coat: Interior latex matching topcoat.
- c. Topcoat: Interior latex (semigloss).

C. Gypsum Board Substrates:

1. Latex System:

- a. Prime Coat: Interior latex primer/sealer and matching topcoat.
- b. Intermediate coat: Interior latex matching topcoat
- c. Topcoat: Interior latex (satin) and (gloss).

END OF SECTION 09 91 23

SECTION 09 93 00 - WOOD STAINS AND TRANSPARENT FINISHES

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. This Section includes surface preparation and the application of wood finishes on the following substrates:
 - 1. Exterior Substrates:
 - a. Exposed dimension lumber (rough carpentry).
- B. Related Sections include the following:
 - 1. Division 9 Section "Exterior Painting" for surface preparation and application of standard paint systems on exterior substrates.
 - 2. Division 9 Section "Interior Painting" for surface preparation and application of standard paint systems on interior substrates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Submit Samples on representative samples of actual wood substrates, 8 inches square.
 - 2. Label each Sample for location and application area.

1.4 QUALITY ASSURANCE

- A. MPI Standards:
 - 1. Products: Complying with MPI standards indicated and listed in its "MPI Approved Products List."
 - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and finish systems indicated.

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 PROJECT 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 exterior finishes 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.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 1. Quantity: Furnish an 1 gal. of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Benjamin Moore & Co.
 2. Dunn-Edwards Corporation.
 3. ICI Paints.
 4. Kelly-Moore Paints.
 5. Basis of Design: PPG Architectural Finishes, Inc
 6. Sherwin-Williams Company (The)

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. Stain Colors: As indicated in a color schedule.

2.3 WOOD FILLERS

- A. Wood Filler Paste: MPI #91.

2.4 STAINS

- A. Exterior Semitransparent Stain (Acrylic /Oil resin Based):

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 work.
 - 1. Maximum Moisture Content of Wood Substrates: 15 percent when measured with an electronic moisture meter.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes.
 - 3. Begin finish application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 4. Beginning application of finish system constitutes Contractor's acceptance of substrate 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 plates, machined surfaces, and similar items already in place that are not to be finished. 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, reinstall items that were removed; use workers skilled in the trades involved. 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 surface dirt, oil, or 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. Countersink steel nails, if used, and fill with putty tinted to final color to eliminate rust leach stains.
- D. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for finish and substrate indicated.
 - 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when finishes are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample finish materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying finishes if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying materials from Project site, pay for testing, and refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces if, on refinishing with complying materials, the two finishes are incompatible.

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 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.

3.6 EXTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Exposed Rough Carpentry Substrates:
 - 1. Semitransparent Stain System:
 - a. Two Stain Coats: Exterior semitransparent stain (Acrylic/Oil resin based).

END OF SECTION 09 93 00

SECTION 09 96 00 - 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 and horizontal surfaces:
 - 1. Concrete unit masonry (exterior exposed – unpainted).
- B. Related Sections include the following:
 - 1. Division 04 Section "Unit Masonry Assemblies" for integral water-repellent admixture for unit masonry assemblies.
 - 2. Division 07 Section "Joint Sealants".
 - 3. Division 09 painting Sections for paints and coatings.

1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section
 - 1. Low-sheen refers to a finish with a gloss range between 30 and 40 when measured at a 60-degree meter.

1.4 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. Samples for Verification: For each material to be applied, on representative samples of the actual substrate.
 - 1. Provide stepped Samples defining each separate coat. Resubmit until required sheen is achieved.
 - 2. List of material and application for each coat of each sample. Label each sample for location and application.

3. Submit samples on the following substrates for Architect's review of shade and sheen:
 - a. Cast-in-place Concrete: Provide two 4-inch-(100-mm-) square samples.
 - b. Concrete and Brick Masonry: Provide two 8-inch-(200-mm-) square samples of masonry, with mortar joint in the center, for each different masonry unit.
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of complete projects with project names and addresses of architects and owners, and other information specified.
- E. Warranty: Special warranty specified in this Section

1.5 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.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each substrate required. Duplicate finish of approved sample Submittals
 1. Architect will select one area or surface of each different substrate to represent surfaces and conditions for application.
 - a. Wall Surfaces: Provide samples on at least 10 sq. ft. or as directed by Architect, of wall surface for each different substrate.
 2. Apply coatings to each surface as specified. Provide the required sheen of each surface.
 - a. After finishes are accepted, Architect will use the surface to evaluate coating systems of a similar nature.
 3. Final approval of coatings will be from benchmark samples.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination"

1.6 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.

1.7 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.

1.8 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 10 Year Vertical Waterproofing/5 Year Graffiti Protection Warranty

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products indicated in other Part 2 articles.

- B. Professional Products of Kansas, Inc., 4456 S. Clifton, Wichita, KS 67216. (800)676-7346.

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 concrete masonry vertical surfaces; and where otherwise indicated:
 - 1. First Coat in the Anti-Graffiti System: Professional Water Sealant, Super Strength, 15% Solids. Substrates such as, but not limited to:
 - a. Split Faced Block
 - 2. Second or Top Coat:
 - a. For porous substrates will be Professional Water Sealant, Super Strength, 15% Solids

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 contaminants from cleaning process will not fall 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.
- 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 inspect the substrate before application of anti-graffiti coatings and 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.
 - a. Coat surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation, coat surface behind permanently fixed equipment or furniture with prime coat only.

- C. Schedule Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.

Apply second coat after allowing the first coat to dry to the touch, approximately one (1) hour

1. Give special attention to edges, corners, crevices, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.

- D. Application Procedures: Apply coatings according to manufacturer's written instructions.

1. Spray Equipment: Use mechanical methods to apply coating as permitted by manufacturer's written instructions and governing regulations.

☞ Use spray equipment with low pressure, high volume with a fan tip and solvent resistant gaskets/fittings. Application pressure between 40 to 60 psi

- E. Completed Work: Match approved Samples for shade and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

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/ collars & threaded studs set in adhesive

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.

Door #	Location	Text 1st line	Text 2nd line	Sign Type	Pictogram A	Pictogram B
BUILDING C – RESTROOM/CONCESSION						
101	Exterior	Concession		B		
103	Exterior	Janitor		B		
102	Exterior	Men’s		A	ISA	Man
104	Exterior	Women’s		A	ISA	Woman

Signage Schedule

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 10 14 23

SECTION 10 21 13 - TOILET COMPARTMENTS

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. This Section includes solid-polymer units as follows:
 - 1. Toilet Enclosures: Floor and ceiling anchored.
 - 2. Urinal Screens: Post supported.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry Miscellaneous Carpentry" for blocking and overhead support of floor-and-ceiling-anchored units.
 - 2. Division 10 "Toilet and Bath Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories.

1.3 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: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of cutouts for compartment-mounted toilet accessories.

1.4 QUALITY ASSURANCE

- A. Comply with requirements in CID-A-A-60003, "Partitions, Toilets, Complete."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating toilet compartments without field measurements. Coordinate wall, floor, ceilings, and other contiguous construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 SOLID-POLYMER UNITS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Accurate Partitions Corporation.
 - 2. Ampco.
 - 3. General Partitions Mfg. Corp.
 - 4. Global Steel Products Corp.
 - 5. Santana Products, Inc.
- B. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) or polypropylene (PP) panel material, not less than 1 inch thick, seamless, with eased edges, 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 of colors and patterns.
- C. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.
- D. Brackets (Fittings):
 - 1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.
- E. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip fastened to exposed bottom edges of solid – polymer components to prevent burning.

2.2 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
 - 1. Material: Stainless steel.
- B. Support Posts for Urinal Screens: Manufacturer's standard aluminum post with floor shoe for anchoring to floor construction.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

2.3 FABRICATION

- A. Floor-and-Ceiling-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies complete with leveling adjustment at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.
- B. Doors: 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 indicated to be accessible to people with disabilities.

1. Hinges: Manufacturer's standard self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees.
2. 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 accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities.
3. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
4. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
5. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with accessibility requirements of authorities having jurisdiction. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

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. Post-Supported Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb and to resist lateral impact.

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to 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 doorstop return doors to fully closed position.

END OF SECTION 10 21 13

SECTION 10 28 00 - TOILET AND BATH ACCESSORIES

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. This Section includes the following:
 - 1. Electric Hand Dryers
 - 2. Public-use washroom accessories.
 - 3. Custodial accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 2. Material and finish descriptions.
 - 3. Manufacturer's warranty.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated on Drawings.
 - 2. Identify products using designations indicated on Drawings.
- C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.4 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, 0.0312-inch minimum nominal thickness, unless otherwise indicated.
- B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359-inch minimum nominal thickness.
- C. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- D. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- E. 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.
- F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.2 ELECTRONIC HAND DRYERS

- A. Basis-of-Design Product: The design for hand dryers is based on products indicated. Subject to compliance with requirements, provide the named product.
 - 1. Dyson Airblade Electric Hand Dryers by Dyson B2B.
 - a. Model AB02– **ITEM A**

2.3 PUBLIC-USE WASHROOM ACCESSORIES

- A. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - 1. American Specialties, Inc.
 - 2. Basis Of Design: Bobrick Washroom Equipment, Inc.
 - 3. Bradley Corporation.
- B. Toilet Tissue (Roll) Dispenser – **ITEM D**
 - 1. Basis-of-Design Product: Bobrick B-4288
 - 2. Description: Roll-in-reserve dispenser with hinged front secured with tumbler lockset.
 - 3. Mounting: Surface mounted.
 - 4. Operation: Spindleless with tension-spring controlled delivery and self-locking device extending through core that prevents core removal until roll is empty.
 - 5. Capacity: Designed for 5-inch- diameter tissue rolls.
 - 6. Material and Finish: Satin-finish aluminum bracket with plastic spindle.
- C. Combination Towel (Folded) Dispenser/Waste Receptacle – **ITEM C**
 - 1. Basis-of-Design Product: Bobrick B-43944
 - 2. Mounting: Recessed.

- a. Designed for nominal **4-inch** wall depth.
 3. Minimum Towel-Dispenser Capacity: 600 C-fold or 800 multifold paper towels.
 4. Minimum Waste-Receptacle Capacity: 16 gal..
 5. Material and Finish: Stainless steel, No. 4 finish (satin).
 6. Liner: Reusable, vinyl waste-receptacle liner.
 7. Lockset: Tumbler type for towel-dispenser compartment and waste receptacle.
- D. Liquid-Soap Dispenser – **ITEM B:**
1. Basis-of-Design Product: Bobrick B-4063
 2. Description: Designed for dispensing soap in lather form.
 3. Mounting: Horizontally oriented, recessed.
 4. Capacity: 50 fl oz..
 5. Refill Indicator: Window type.
- E. Grab Bar – **ITEM U , ITEM M , ITEM F**
1. Basis-of-Design Product: Bobrick B-5806x18, B-5806x42, B- 5837
 2. Mounting: Flanges with concealed fasteners.
 3. Material: Stainless steel, 0.05 inch thick.
 - a. Finish: Smooth, No. 4, satin finish on ends and slip-resistant texture in grip area.
 4. Outside Diameter: 1-1/2 inches.
 5. Configuration and Length: As indicated on Drawings.
- F. Vendor – **ITEM H**
1. Basis-of-Design Product: Bobrick B-43500
 2. Type: Sanitary napkin and tampon.
 3. Mounting: Fully recessed, designed for 4-inch wall depth.
 4. Operation: Two coin (50 cents).
 5. Exposed Material and Finish: Stainless steel, No. 4 finish (satin)
 6. Lockset: Tumbler type with separate lock and key for coin box.
- G. Sanitary-Napkin Disposal Unit – **ITEM J**
1. Basis-of-Design Product: Bobrick B-270
 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).
- H. Seat-Cover Dispenser – **ITEM E**
1. Basis-of-Design Product: Bobrick B-4221
 2. Mounting: Surface mounted.
 3. Minimum Capacity: 250 seat covers.
 4. Exposed Material and Finish: Stainless steel, No. 4 finish (satin).
 5. Lockset: Tumbler type.
- I. Mirror Unit – **ITEM A & K**
1. Basis-of-Design Product: Bobrick B-165

2. Frame: Stainless-steel channel.
 - a. Corners: Manufacturer's standard.

3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
 - a. One-piece, galvanized steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
 - b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

4. Size: As indicated on Drawings.

J. Towel (Folded) Dispenser – **ITEM V**

1. Basis-of-Design Product: Bobrick B-4262
2. Mounting: Surface

2.4 CHILDCARE ACCESSORIES

- A. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Basis of Design: Koala Corporation.

B. Diaper-Changing Station – **ITEM G**

1. Basis-of-Design Product: Bobrick KB100-00
2. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.
 - a. Engineered to support a minimum of 250-lb static load when opened.
3. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
4. Operation: By pneumatic shock-absorbing mechanism.
5. Material and Finish: High-density polyethylene in manufacturer's standard color.
6. Liner Dispenser: Built in.

2.5 CUSTODIAL ACCESSORIES

- A. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. American Specialties, Inc.
2. Basis of Design: Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.

B. Mop and Broom Holder –**ITEM L**

1. Basis-of-Design Product: Bobrick B-239
2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 36 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).
 - a. Shelf: Not less than nominal 0.05-inch- thick stainless steel.
 - b. Rod: Approximately 1/4-inch- diameter stainless steel.

2.6 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 method in 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 10 28 00

SECTION 10 44 13 - FIRE EXTINGUISHER CABINETS

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:
 - 1. Fire protection cabinets for the following:
 - a. Portable fire extinguishers.
- B. Related Sections:
 - 1. Division 10 Section "Fire Extinguishers."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.
 - 1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
- B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function.
- D. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

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 MATERIALS

- A. Stainless-Steel Sheet: ASTM A 666, Type 304.
- B. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 FIRE PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Products: Subject to compliance with requirements:
 - a. Basis of Design: Larsen's Manufacturing Company; Model # 2409-R7
 - b. J. L. Industries, Inc., a division of Activar Construction Products Group;.
 - c. Potter Roemer LLC;.
- B. Cabinet Construction: Nonrated.
- C. Cabinet Material: Stainless-steel sheet.
- D. Semirecessed Cabinet: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Provide where walls are of insufficient depth for recessed cabinets but are of sufficient depth to accommodate semirecessed cabinet installation.
 - 1. Rolled-Edge Trim: 1 ½" backbend depth.
- E. Cabinet Trim Material: Stainless steel sheet
- F. Door Material: Stainless-steel sheet.
- G. Door Style: Vertical duo panel with frame.
- H. Door Glazing: Tempered float glass (clear).
- I. 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 door pull and friction latch.
 - 2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.
- J. 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. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
- K. Finishes:
 - 1. Manufacturer's standard baked-enamel paint for the following:
 - a. Exterior of cabinet, door, and trim except for those surfaces indicated to receive another finish.

b. Interior of cabinet and door.

2. Stainless Steel: No. 6.

2.3 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.
4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.

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.

2.4 GENERAL FINISH REQUIREMENTS

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 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.

2.5 STAINLESS-STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
3. Dull Satin Finish: No. 6.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for semirecessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire protection cabinets in locations and at mounting heights indicated on drawings.
- B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire protection cabinets.
 - 2. Provide inside latch and lock for break-glass panels.
 - 3. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

3.4 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 10 44 13

SECTION 10 44 16 - 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 10 44 16

SECTION 22 00 00 – PLUMBING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The requirements of this SECTION apply to all the work of DIVISION 22.
- B. Provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment which is shown or listed, provide an item which will allow the system to function properly at no increase in Contract Sum.

PART 2 - QUALITY ASSURANCE

2.1 REQUIREMENTS OF REGULATORY AGENCIES:

- A. In accordance with the requirements of DIVISION 01.
- B. Nothing in the Drawings or Specifications shall be construed to permit work not conforming to applicable laws, ordinances, rules, regulations.
- C. When Drawings/Specifications exceed requirements of applicable laws, ordinances, rules, regulations, Drawings/ Specifications take precedence.
- D. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.
- E. If any of the requirements of the above are in conflict with one another, or with the requirements of these Specifications, the most stringent shall govern.
- F. If the Drawings and Specifications are in conflict, or with each other, the most stringent shall apply.
- G. IBC - 2012 International Building Code.
- H. UPC - 2012 Uniform Plumbing Code.
- I. IECC - 2009 International Energy Conservation Code.
- J. Nevada State Regulatory Agencies.
- K. City of Sparks Local Ordinances.

2.2 REFERENCE STANDARDS:

- A. ANSI - American National Standards Institute.
 - 1. A13.1, "Scheme for the Identification of Piping Systems."
- B. ASME - American Society of Mechanical Engineers.
- C. NFPA - National Fire Protection Association.

- D. OSHA - Occupation Safety and Health Administration.
- E. ASTM - American Society for Testing and Materials.
- F. UL- Underwriters Laboratories, Inc.

PART 3 - SUBMITTALS

3.1 GENERAL:

- A. Submit Shop Drawings, penetration locations, supplemental data, for all materials, equipment in all SECTIONS of this DIVISION in accordance with the requirements of "SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES" and as specified hereinafter.
- B. Forward all submittals to Architect, together, at one time. Individual or incomplete submittals are not acceptable.
- C. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. Words "as specified" are not sufficient identification.
- D. Identify each submittal item by reference to project name, date, specification section paragraph in which item is specified, or drawings and detail number.
- E. Organize submittals in same sequence as they appear in specification sections, articles or paragraphs and insert in hard 3 ring binders.
- F. Shop Drawings shall show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation and maintenance, physical size, mechanical characteristics, foundation and support details, weight.
 - 1. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of the Contract Documents.
 - 2. Drawings shall be drawn to scale and dimensioned (except piping diagrams not to scale). Drawings may be prepared by vendor but submitted as instruments of Contractor, thoroughly checked and stamped by Contractor before submission to Architect for review.
 - 3. Catalog cuts and published material may be included to supplement scale drawings.

3.2 Operating and Maintenance Instructions and Manuals: In accordance with the following requirements:

- A. Subsequent to completion of balancing and testing operations, this DIVISION is responsible for instructing the Owner's authorized representatives in operation, adjustment and maintenance of mechanical plant. Submit three (3) copies of certificate, signed by Owner's representatives, attesting to their having been instructed.
- B. Before Owner's personnel assume operation of systems, submit three (3) sets of operating maintenance instructions, manuals, parts lists, on mechanical plant, its component parts including all major equipment and/or that equipment which requires, or for which manufacturer recommends maintenance in a specified manner. Data sheets shall show complete internal wiring, mechanical and electrical ratings and characteristics, catalog data on component parts whether furnished by equipment manufacturer or others, names, addresses and telephone numbers of source of supply for parts subject to wear or electrical failure, and description of operating, test, adjustment, and

maintenance procedures.

1. Where data sheets included in manual cover equipment, options, or other features no part of equipment actually furnished, line out these references or otherwise clearly mark so remaining text, diagrams, drawings, schedules, and similar information remaining shall apply specifically to equipment furnished.
 2. Bind data in vinyl covered loose-leaf binders with title index tabs identifying items therein include:
 - a. Gas Water Heater;
 - b. Circulation Pumps;
 - c. Insulation – pipe;
 - d. Plumbing Fixtures:
 3. Submit drafts of instruction sheets to Architect for review before preparing final sets.
 4. Not all items listed above require maintenance however are listed for scope.
- C. RECORD DRAWINGS: Maintain at all times during construction, a complete set of pertinent drawings which shall be maintained correct to show actual construction of mechanical work. Upon completion of work, request a set of reproducible drawings of original drawings from the Architect. Reproducible prints shall be paid for by Contractor. Upon completion of work, transfer all Record Drawing corrections to reproducible drawing and deliver corrected reproducible drawing together with one set of prints to Owner. All corrections made to reproducible drawing shall be of a quality equal to that of original drawings.
- D. GUARANTEE: Contractor shall submit written Guarantee stating that all work under this Section shall be guaranteed against any defects in materials and/or workmanship for a period of one year from date of Notice of Completion and defective work which develops during guarantee period shall be repaired and/or replaced at no additional cost to Owner.
- 3.3 Reports from manufacturers authorized representative certifying their supervision of equipment installation and start-up procedures.

PART 4 - PRODUCT DELIVERY, STORAGE AND HANDLING

- 4.1 Ship equipment in its original package to prevent damage or entrance of foreign matter. Perform all handling and shipping in accordance with manufacturer's recommendations. Provide protective coverings during construction.
- 4.2 Identify materials and equipment delivered to site to permit check against approved materials list, reviewed Shop Drawings.
- 4.3 Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.

PART 5 - DRAWINGS AND COORDINATION WITH OTHER WORK

- 5.1 DRAWINGS:
 - A. For purposes of clarity and legibility, Drawings are essentially diagrammatic to the extent that many offsets, bends, unions, special fittings and exact locations of items are not indicated, unless specifically dimensioned.

- B. Exact routing of piping, ductwork, etc., shall be governed by architectural and structural conditions, obstructions. Contractor shall make use of data in Contract Documents. In addition, Architect reserves right, at no increase in Contract Sum, to make any reasonable change in location of mechanical items, exposed at ceiling and/or walls, to group them into orderly relationships and/or increase their utility. Contractor shall verify Architect's requirements in this regard prior to roughing-in.
- C. Dimensions, location of doors, partitions, similar physical features shall be taken from Architectural Drawings, verified at site under this DIVISION. Do not scale drawings. Consult Architectural features, panels, etc. at the approximate location shown on Mechanical Drawings.
- D. Mounting heights of brackets, outlets, etc. shall be as required.

5.2 COORDINATION:

- A. Work out all "tight" conditions involving work under this DIVISION and work in other DIVISIONS in advance of installation. If necessary, and before work proceeds in these areas, prepare Shop Drawings under this DIVISION for review showing all work in "tight" areas. Provide Shop Drawings, additional work necessary to overcome "tight" conditions, at no increase in Contract Sum. Failure to provide Shop Drawings will be at the Contractor's risk.
- B. Differences or disputes concerning coordination, interference or extent of work between SECTIONS shall be decided by Contractor, his decision, if consistent with Contract Documents requirements, and shall be final.
- C. Provide templates, information and instructions to other DIVISIONS to properly locate holes and openings to be cut or provided for electrical work.
- D. Not all offsets piping are shown. Contractor shall decide which item to offset or relocate. Maintain required slope in piping.
- E. Responsibility for problems as a result of not providing shop drawings shall be borne by the contractor.

5.3 Large Scale Layout Drawings: In accordance with requirements of SECTION "RECORD DOCUMENTS" prepare large scale detailed layout drawings showing locations of equipment, piping runs, ductwork, and all other elements of mechanical systems provided under this DIVISION. Include sections of all congested areas to show relative position and spacing of affected elements.

5.4 EQUIPMENT ROUGH-IN:

- A. Rough-in locations shown on Mechanical Drawings for equipment furnished by Owner and for equipment furnished under other DIVISIONS are approximate only. Obtain exact rough-in locations from Shop Drawings for Contractor furnished and installed equipment.
- B. Verify mechanical and electrical characteristics of equipment before ordering equipment or starting rough-in. Where conflict exists between equipment and rough-in shown on Drawings obtain clarification from Architect and provide as directed.

PART 6 - PRODUCTS

6.1 MATERIALS

- A. Identify materials, equipment by manufacturer's name, nameplate data. Remove unidentified materials, equipment from site.

- B. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalogue as standard with equipment. Furnish optional or additional accessories as specified.
- C. Where no specific make of material or equipment is mentioned, any first class product of reputable manufacturer may be used, provided it conforms to requirements of system and meets with acceptance.
- D. Equipment, material damaged during transportation, installation operation is considered as totally damaged. Replace with new. Variance from this permitted only with written acceptance.
- E. Provide an authorized representative to constantly supervise work of this DIVISION, check all materials prior to installation for conformance with Drawings, Specifications, and reviewed Shop Drawings.

PART 7 - EXECUTION

7.1 INSTALLATION

- A. Manufacturer's Directions: Follow in all cases where manufacturers of articles furnish directions covering installation points not specified or shown.
- B. Equipment which is required to be field assembled shall be assembled at no extra cost and under the direct supervision of the manufacturer's agent. Prior to the final acceptance submit letters from the manufacturers that this has been done.
- C. Equipment: Accurately set and level with supports neatly placed and properly fastened. Properly fasten equipment in place with bolts to prevent movement in earthquake. No allowance of any kind will be made for negligence on part of Contractor to foresee means of bringing in, installing equipment into position inside building.
- D. Piping Systems:
 - 1. Work into complete, integrated arrangement with like elements to make work neat appearing, finished.
 - 2. Run concealed, except as shown otherwise; where exposed, parallel with walls or structural elements; vertical runs plumb, horizontal runs level, parallel with structure or uniformly pitched as appropriate.
 - 3. Install with adequate passageways free from obstructions, as high as practicable to maintain adequate head room, as shown or required. Notify Architect before installation whenever head room of less than 7-feet 6-inches or as called for on drawings will result. Coordinate with work of other DIVISIONS to achieve proper head room as specified in this DIVISION.
 - 4. Clearance: Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.
 - 5. Flash and counterflash all pipes and ducts through roof in accordance with requirements of "FLASHING AND SHEET METAL". All work to conform to metal roof manufacturers requirements. Prepare all exposed materials for painting.
 - 6. Expansion and Contraction: Make adequate provisions, whether those provisions are shown or not.
 - 7. Cleaning and Closing: Inspect all piping and equipment and clean as required before closing. Close all piping and ductwork at end of each day's work.
- E. Devices complete as required for installation of mechanical work.

1. Devices to be of metal only; no wood or combustible material will be permitted.
2. Hangers, anchors and supports for pipe and duct runs: As shown or required.
3. Provide concrete inserts for attachment of hangers; subject to structural engineer's review.
4. Anchors for floor and wall mounted equipment as shown or required.
5. Supports for wall mounted equipment as shown or required.
6. Seismic anchors and supports for Zone 3. Reference: S.M.A.C.N.A. "SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS" using Seismic Hazard Level "C" and Connection Level "1".

PART 8 - PERFORMANCE

8.1 EXCAVATING AND BACKFILLING:

- A. In accordance with the requirements of "EARTHWORK".
- B. Provide all necessary shoring, sheeting, pumping as part of work of this DIVISION.
- C. Dig trenches straight, true to line and grade with bottoms smoothed of any rock points. Excavate 3-inches below grade of pipe, fill with sand properly packed. Support pipe for entire length on packed sand. Shape or pack bottom of trenches for pipe, duct fittings, hubs, couplings, etc. using templates to fit outside periphery of lower third of piping and ductwork. Cover for all other piping shall be in accordance with code. Water piping outside building shall have 36-inch minimum cover.
- D. Backfill:
 1. After piping has been installed, tested and approved, backfill all excavations, tamp and compact by compressed air tampers to 95% compaction.
 2. Backfill to 6-inches above crown of pipe. Material shall consist of unwashed sand, with remainder of trench backfilled and mechanically tamped in 6-inch maximum layers of selected excavated materials, free from organic matter, rocks, etc.
- E. Provide thrust blocks for all water piping below grade.
- F. In any asphalt or concrete paved areas, backfill only to subgrade level.

8.2 Concrete: In accordance with the requirements of DIVISION 3.

8.3 Sleeves, Chases, and Concrete Inserts:

- A. This DIVISION shall provide, to cause no delay, all required sleeves, chases, concrete inserts, anchor bolts, etc., before concrete is poured, be responsible for correct location, installation of same.
- B. Sleeves and chases are prohibited in structural members, except where shown or directed by the Architect in writing.
- C. Embed no piping in concrete or masonry.
- D. Locating and sizing of openings for ductwork through walls, roof, etc., under this DIVISION. Framing of openings provided by respective DIVISIONS in whose work opening is made.
- E. Sleeves shall be metal or plastic.

8.4 CUTTING AND REPAIRING:

- A. Do all cutting, repairing, including structural reinforcing, necessary for work under this DIVISION.
- B. Do no cutting or patching without Architect's review. Repair damage done by this cutting equal to original condition in Architect's opinion.
- C. Assume responsibility for all damage to any part of premises or work of other DIVISIONS, caused by leaks or breaks in piping or equipment furnished and/or installed under this DIVISION during construction and guarantee period.

8.5 OPENINGS:

- A. Contractor shall determine exact location and size of openings required in the building for pipe and ductwork penetrations.

PART 9 - TESTING AND ADJUSTING

- 9.1 Furnish all labor and test equipment required under this DIVISION.
- 9.2 Clean and purge equipment and piping before each test.
- 9.3 Test various mechanical systems in portions as work progresses. Any system or portion previously tested shall become part of any repeated test when it becomes part of distribution or collection system.
- 9.4 Repair leaks by remaking with new material. Makeshift leak stopping methods are not acceptable.
- 9.5 Should any piece of equipment or material fail in any of the tests, immediately remove, replace with new; retest system.
- 9.6 Maintain test pressures for periods stated, or as directed, without loss in pressure except that due to change in temperature or atmospheric pressure during test.
- 9.7 Perform all tests in accordance with requirements and under supervision of authorities having jurisdiction.
- 9.8 After completion of testing and adjustment, operate the different systems and equipment under normal working conditions for two (2) days for seven (7) hours each day, and show specified performance. If, in the opinion of the Architect, performance or equipment or systems is not in accordance with Specifications or submitted data, alter or replace equipment at no increase in Contract Sum. Contractor at his option may order tests from an independent approved laboratory to prove compliance. All such tests shall be at no increase in Contract Sum.
- 9.9 At completion of work, provide written certification that all systems are functioning properly without defects.
- 9.10 Sterilization and cleaning of water lines: All domestic cold and hot water lines to be flushed clean before installation and thoroughly flushed and drained after installation. Accomplish sterilization by opening taps at ends of all branches and injecting a solution of liquid chlorine or sodium hypochlorite and water containing not less than 50-ppm of free chlorine into system near the source main. During this procedure, operate all valves and outlets and test for residual chlorine. Let stand for 24-hours

minimum then drain and thoroughly flush until all traces of chlorine are eliminated (less than 0.2-ppm). This Work to be performed in accordance with the State of California Regulations.

9.11 TESTING:

- A. Hot and cold water: Test to 100-psig with water. Pressure shall be maintained for 8 hours with no noticeable drop.
- B. Waste and vent leaders above grade: Test to 5 PSIG with air. Pressure shall not have any noticeable drop within a 15 minute period.
- C. Waste and vent leaders below grade or slab: Test with water to the highest vent point of the system. Maintain for 2 hours with no noticeable drop.
- D. Natural Gas: Test to 60 psig with air. Pressure shall not drop for a period of four hours. Check all joints with a soap solution.

PART 10 - CLEANING AND PAINTING

- 10.1 Properly prepare exposed work under this DIVISION to be finish painted.
- 10.2 Refinish work supplied with final finish under this DIVISION if damaged under this DIVISION to satisfaction of Architect.
- 10.3 Thoroughly clean all equipment, fans, motors, piping and all other materials under this DIVISION free from all rust scale and all other dirt before any covering or painting is done, or the systems put in operation. Leave in condition satisfactory to the Architect.
- 10.4 Protect all finished surfaces of fixtures with heavy paper pasted thereon, or by other means, throughout the period of construction.
- 10.5 All interior surfaces of ceiling diffusers, registers, grilles, etc., including ductwork visible from inside the building, shall be etched, primed, and painted flat black.

PART 11 - EQUIPMENT IDENTIFICATION

- 11.1 Properly identify each piece of equipment and controls pertaining thereto by means of engraved laminated plastic descriptive nameplates mounted on equipment and controls using round head brass machine screws, pop rivets or contact cement. Cardholders in any form not acceptable. Label shall contain the symbol, duty, capacity, and pressure.
- 11.2 Provide typewritten list of equipment in triplicate, indicating location, service for each piece of equipment, suitably framed with glass front.

END OF SECTION 22 00 00

SECTION 22 07 00 – PLUMBING INSULATION

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. DESCRIPTION

1. Work in this Section:

- a. Pipe Insulation:
 - 1) Hot water and hot water return piping water supply;
 - 2) Refrigeration suction lines.
- b. Provide incidental items not shown or specified that belong to the Work described or are required for complete systems.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe Insulation:

1. Insulate all piping with Owens Corning ASJ/SSL-II insulation:

- a. Thickness:
 - 1) Hot water and hot water return:
1-½-inch and smaller - 1"
 - b. The insulation shall have a factory applied vapor barrier jacket. Make application on clean, dry pipe with all joints butted firmly together. Seal longitudinal laps with approved vapor barrier adhesive. Wrap butted joints with 4-inch strip of vapor barrier jacket cemented with vapor barrier adhesive.
 - c. Insulate all fittings by wrapping metered section of pipe insulation or fiberglass blanket to slightly greater thickness than adjoining pipe insulation. Cover fittings and couplings with "Zeston" molded fiberglass covers.
2. Insulate all refrigeration suction lines with ½" Armstrong type FR Armaflex or equal. Protect insulation outdoors with Armstrong "Weathercoat" or equal.
3. Insulation Inserts: Where insulation supports weight of pipe, install between pipe and hanger, a rigid support 9-inches long, with vapor barrier jacket attached.

B. Acceptable manufacturers are Owens Corning, Manville, CertainTeed, or Knauf.

C. Submit samples of all insulation with submittal.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General: Install all insulation in accordance with manufacturer's published instructions. Surfaces being insulated shall be clean, smooth and dry.

END OF SECTION 22 07 00

SECTION 22 10 00 – PLUMBING PIPING

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. DESCRIPTION

1. The requirements of this SECTION apply to all Work of DIVISION 22 where applicable.
2. Where items specified in other SECTIONS of DIVISION 22 conflict with requirements of this SECTION, the former shall take precedence.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Mechanical Equipment and Material Categories:

1. Piping and Fittings:

- a. Standard weight cast iron soil pipe with no-hub stainless steel band and neoprene collar, conforming to CISPI 301 standard: Waste and vent inside building to a point five feet outside building.
- b. Type "L" hard drawn copper tubing with wrought copper fittings conforming to ASTM B88-83 using 95:5 tin/antimony solder: Hot/cold water and condensate drains inside building above slab.
- c. Type "L" soft copper tubing with no fittings: Domestic hot and cold water inside building below slab to trap primers.
- d. Schedule 40 black steel with 150 pound black malleable iron screwed fittings conforming to Standard ANSI B16.3-1977 2-1/2" and smaller: natural gas above slab.
- e. Type L-ACR hard drawn copper cleaned and capped: Refrigeration lines.

B. Cleanouts:

1. Provide and install cleanouts where indicated and at all bends, angles and upper terminals, urinals and sinks. All shall be accessible. All cleanouts shall be the same as pipe served.
2. Wall cleanouts in toilet rooms shall be cast iron cleanout tee with cast bronze countersunk plug complete with round, stainless steel access cover with securing screw. Approved types are Zurn Z-1441 or Z-1446, Wade W-8550-S or W-8470-R, Smith 4402 or 4477. Wall cleanouts shall be roughed-in 12 to 18" above finished floor.
3. Interior cleanouts in finished floor shall be adjustable floor level after slab has been poured and set with square scoriated top of nickel bronze, vandal-proof screws, cast brass cleanout plug. Approved types are Zurn ZN 1400-2, Wade W-7000, Smith 4020.
4. Exterior cleanouts shall be cast iron cleanout housing secured scoriated top with lifting device and the word "CLEANOUT" cast integral. Approved types are Zurn Z-1460-15, Wade W-8300-MF, Smith 4253.

A. Valve schedule:

1. Hot and cold water: 2-inches and smaller.

- a. Ball Valves:
 - 1) Red/White Figure 5044F, threaded end (full port).
 - 2) Red/White Figure 5049F, soldered end (full port).
- b. Check Valves:
 - 1) Red/White No. 236T, horizontal swing check threaded end.
 - 2) Red/White No. 237T, horizontal swing check soldered end.
- 2. Natural gas:
 - a. U/L approved lubricated plug type gas cock.
- 3. Relief Valves:
 - a. Provide relief valves as indicated, of size and capacity as selected by Contractor for proper relieving capacity, in accordance with ASME Boiler and Pressure Vessel Code.
 - b. Combined Pressure-Temperature Relief Valves: Bronze body, test lever, thermostat, complying with ANSI A21.22 listing requirements for temperature discharge capacity. Provide temperature relief at 210 degrees F, and pressure relief at 150 psi. Rating shall be in accordance with AGA listing.
 - c. Manufacturer: Subject to compliance with requirements, provide relief valves of one of the following: Watts Regulator Company, Cash (A.W.) Valve Manufacturing Corporation, Zurn Industries, Inc.; Wilkins-Regulator Division
- 4. Pressure Regulators: U/L approved adjustable iron or bronze body with strainer and vent/gauge connections.
- 5. Approved manufacturers are: Red & White, Nibco, or Kitz.

PART 3 - FABRICATION AND MANUFACTURE

- 3.1 Follow manufacturer's directions in all cases where manufacturers of articles used furnish directions covering all points not shown or specified.

PART 4 - EXECUTION

4.1 INSTALLATION:

A. Installation of Piping:

- 1. Definition of "PIPING": The term "piping" as used in Drawings or in Specifications, means all pipe, fittings, nipples, valves, unions, etc., as may be required for complete, functional system.
- 2. Accurately cut pipe and work into place without springing or forcing, except when cold springing is required.
- 3. Install pipe lines free from traps and air pockets. Arrange water piping for draining at low points and vent at high points free of traps, sags and bends. Drain valves shall be accessible.
- 4. Piping in any partitions, through plates, studs, etc., shall have sufficient clearance from structure to allow for expansion, contraction of piping. No bare piping should touch wood, concrete, etc., at any time.
- 5. If noise appears after building is completed, Contractor shall perform necessary work to eliminate noise, refinish walls, floors, etc., disturbed by such Work at no increase in Contract Sum.

B. Installation of Valves:

- 1. All piping systems shall have valves at points for complete isolation of equipment, pumps, and automatic valves and arranged so as to give complete and regulating control of piping systems throughout the system. Install valves with neat appearance and grouping and

- accessible, so that all parts are easily accessible for maintenance.
2. Valves and trim shall be as recommended by the manufacturer for the service and pressure with which valve is to be installed. Special attention shall be paid to high pressure system valves, etc. Valve working pressure shall exceed test pressure.
 3. Use ball valves except where clearances restrict their use.
 4. Valves shall be same size as line in which installed.
- 4.2 PIPING JOINTS:
- A. Copper: Cut copper tubing with copper tube cutters, size with sizing tool and thoroughly clean before application of flux or solder. Piping above slab shall be 95:5 tin-antimony and piping below grade/slab shall be made up with 15% silver solder.
 - B. No-hub cast iron fittings shall be made in accordance with pipe manufacturer's recommendations including torque. Use a regular or adhesive lubricant to maintain air pressure test.
 - C. Natural gas with screwed joints shall be properly threaded and reamed with lead free pipe compound approved for the application applied to male threads only. There shall be no more than 3 threads visible after joining.
 - D. Refrigeration Piping: Silver solder shall be approved for refrigeration service.
- 4.3 Copper tubing systems shall have IPS red brass pipe or nipples at all connections requiring rigidity (at equipment, through roof, at anchors, etc.).
- 4.4 Reducers, increasers for all valves, strainers, etc., shall be line size unless otherwise shown or specified. Straight or eccentric reducers to suit shall be installed as close as possible to connection of greater or smaller size than pipe line (equipment, temperature control valves, etc.). Use of bushings or close nipples not allowed.
- 4.5 Provide union or flange at each connection to equipment, on both sides of control valves, downstream of each valve, at each strainer and trap. Install unions at both ends of valves, strainers, etc., when valves, strainers etc., are specified in welded steel piping, install screwed flanges.
- 4.6 Provide U/L shut-off valve, union, and 6" drip leg at each appliance. Flex connectors are not allowed.
- 4.7 Install valves with handwheels at or above centerline.
- 4.8 Install check valves, strainers in horizontal position.
- 4.9 Copper to Steel Connections:
- A. Make all copper pipe connections to ferrous piping with Victaulic Waterway fittings.
 - B. Make buried copper or brass piping connections to steel or cast iron piping with dielectric isolation flanges, field wrapped with two (2) layers of "Scotchrap" or equal, applied according to manufacturer's instructions. Each wrapping 5-feet minimum in all directions from connection. Cover taped piping with 15-pound tar of asphalt saturated felt jacket taped in place, to provide protection during backfill.
- 4.10 Provide all piping passing through finish floors, ceilings, partitions or walls exposed to view with chromium plated escutcheons. Fit escutcheons for insulated pipe over insulation. Provide pipe clamps on all penetrations of floors.

- 4.11 Provide rigid support of all piping penetrating fire walls.
- 4.12 Pipe Hangers and Supports:
- A. All piping supports, hangers, hanger rods, etc., shall be as per manufacturer's recommendation of pipe full of water, with minimum safety factor of 5.
 - B. Isolate pipe supported by clamps or hooks from supports and building construction with felt.
 - C. Clamps shall not anchor piping, unless anchoring is required.
 - D. Supports from overhead construction: In accordance with truss manufacturers details. If details not provided, submit a proposed method for approval.
 - E. Supports from wall shall be steel brackets, hooks, clamps attached to wall with anchor bolts.
 - F. Resiliently isolate any copper piping with pipe isolators.
 - G. Hanger rods shall be solid mild steel in accordance with the following schedule:

2" and smaller	3/8" diameter rod
2-1/2" to 3-1/2"	1/2" diameter rod
4"	5/8" diameter rod
 - H. Where rod length exceeds 18", lateral bracing shall be provided at each fourth hanger. No piping shall be supported by any wire, ropes, wood, or other makeshift devices. All pipe hangers shall be black iron finish.
 - I. Hanger spacing shall not exceed the following:

	<u>Steel</u>	<u>Copper</u>
3/4" and smaller	6 feet	5 feet
1" to 1-1/4"	7 feet	6 feet
1-1/2" to 2"	10 feet	8 feet
2-1/2" to 3"	12 feet	10 feet
4"	14 feet	
 - J. Support cast iron piping at no more than 5-foot intervals and at each fitting.
 - K. Install hanger within 12-inches of each change of direction and for each branch 5-feet and longer.
 - L. Adjust each hanger to carry its proper share of load.
 - M. Install additional supports and/or braces if, during test or normal operation, piping should sway, crawl or vibrate. Piping shall be immobile.
 - N. Support piping below any ductwork from wall or on trapeze with hanger rods outside of ductwork.
 - O. Support all piping, including valves, etc., independently of equipment; no piping weight or stress due to expansion, construction shall be transmitted to equipment. Contractor shall be responsible for proper alignment of piping at equipment in all conditions (maximum hot to minimum cold); install anchors, guides, bracing, spring supports as required. Flexible connections, expansion joints' deflections shall be always within allowable limits. Piping at equipment shall not be insulated until inspected for alignment at extreme temperature conditions.

- 4.13 Electrical Work under this DIVISION shall conform to all requirements of DIVISION 26.
- 4.14 Sound and Vibration Isolation:
- A. Sound isolate all vibrating equipment from supporting structure, using grommets (around bolts), washers, and sound isolation pads.
- 4.15 Pipe Identification:
- A. Identify each piping system provided under this Work with direction of flow indicated by means of colored legends and flow areas, in accordance with OSHA requirements. Apply the markings after all cleaning and painting of piping and insulation is completed.
 - B. Apply identification to all exposed piping and to all piping which can be seen in ceiling or wall spaces, by means of access panels, doors, accessible ceiling systems, etc., and all exposed piping. Any piping completely concealed within nonaccessible spaces will not require identification.
 - C. Apply legend and flow arrows at all valves, gauges, thermometers, at all points where piping enters or leaves a wall, partition, cluster of piping, or similar obstruction, and at approximately 10-foot intervals on pipe runs. Practical variations or changes in locations and spacing may be made with specific approval of the Architect to meet specific conditions. Wherever two (2) or more pipes run parallel, apply printed legend and other markings in the same relative location so as to be in either vertical or horizontal linearity, whichever the case may be. Locate markings so as to be readily conspicuous at all times from any reasonable vantage point.
 - D. Pipe markings shall be "Setmark Snap-On" by Seton Nameplate Corporation or equal.

END OF SECTION 22 10 00

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. GENERAL

1. The Conditions of the Contract (General, Supplementary and other Conditions) and the General Requirements (Sections of Division 01) are hereby made a part of this Section.

B. WORK INCLUDED

1. Furnish all materials and labor necessary to complete the installation of Plumbing Fixtures as indicated, specified herein or both. The Work of this Section includes, but is not necessarily limited to the following:
 - a. Fixtures;
 - b. Trim;
 - c. Provide incidental items not shown or specified that belong to the Work described or are required for complete systems.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. See Schedule on Drawings.
- B. All fixtures and trim shall conform to the latest Water Conservation Standards: 1.6 G.P.F. for water closets and 0.5 G.P.F. for urinals; .5 G.P.M. self-closing lavatory faucets and 2.5 G.P.M. flow restrictors on all sinks.
- C. All handicap fixtures and installation shall conform to the latest ADA Standards.
- D. Acceptable china fixtures shall be American Standard or Kohler.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide polished chrome-plated brass lavatory stops, supplies, tailpieces, traps, trap arms and escutcheons.
- B. Each fixture supply shall have a stop.
- C. Install fixtures in accordance with manufacturer's recommendations except where shown. Mounting height and exact location shall be as shown on the Architectural drawings.
- D. Install equipment in accordance with manufacturer's recommendations.

- E. Seal behind all wall hung plumbing fixtures with white sealant.
- F. Fixtures shall be hung, supported or set with brass bolts or screws or sufficient length to securely fasten fixture to backing, wall or closet ring.
- G. Heads and nuts of bolts exposed at fixtures shall have chromium-plated finish. All exposed supported brackets shall be enamel painted to harmonize with fixtures.
- H. Fixtures set against stud walls shall have their hangers secured to metal backing plate. Metal backing plate shall be installed at the time the rough piping is installed, and shall be steel plate, 3/16-inch thick, and not less than 8-inches wide. Plate shall be attached to studs at each end of plate, and to each stud which it passes (but in no case less than three studs). Plate shall be attached by bolting with not less than two 1/4-inch "U" bolts per stud with bolts through plate and around flange of stud, or by welding with a 1/8-inch fillet weld across full width of flange at top and bottom of each plate.
- I. Adjust all self-closing faucets to close in 10 to 15 seconds.
- J. Install Scald-Gard protection on p-trap and hot water supply for all handicap lavatories and handicap sinks. See architectural drawings for locations of handicap accessible sinks and lavatories.

END OF SECTION 22 40 00

SECTION 23 00 00 – HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The requirements of this SECTION apply to all the work of DIVISION 23.
- B. Provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment which is shown or listed, provide an item which will allow the system to function properly at no increase in Contract Sum.

PART 2 - QUALITY ASSURANCE

2.1 REQUIREMENTS OF REGULATORY AGENCIES:

- A. In accordance with the requirements of DIVISION 01.
- B. Nothing in the Drawings or Specifications shall be construed to permit work not conforming to applicable laws, ordinances, rules, regulations.
- C. When Drawings/Specifications exceed requirements of applicable laws, ordinances, rules, regulations, Drawings/ Specifications take precedence.
- D. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.
- E. If any of the requirements of the above are in conflict with one another, or with the requirements of these Specifications, the most stringent shall govern.
- F. If the Drawings and Specifications are in conflict, or with each other, the most stringent shall apply.
- G. IBC - 2012 International Building Code.
- H. UMC - 2012 Uniform Mechanical Code.
- I. IECC - 2009 International Energy Conservation Code.
- J. Nevada State Regulatory Agencies.
- K. City of Sparks Local Ordinances.

2.2 REFERENCE STANDARDS:

- A. ANSI - American National Standards Institute.
 - 1. A13.1, "Scheme for the Identification of Piping Systems."
- B. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.
- C. ASME - American Society of Mechanical Engineers.

- D. AMCA - Air Movement and Control Association.
- E. NFPA - National Fire Protection Association.
- F. OSHA - Occupation Safety and Health Administration.
- G. ASTM - American Society for Testing and Materials.
- H. UL- Underwriters Laboratories, Inc.
- I. ADC - Air Diffusion Council.

PART 3 - SUBMITTALS

3.1 GENERAL:

- A. Submit Shop Drawings, penetration locations, supplemental data, for all materials, equipment in all SECTIONS of this DIVISION in accordance with the requirements of "SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES" and as specified hereinafter.
- B. Forward all submittals to Architect, together, at one time. Individual or incomplete submittals are not acceptable.
- C. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. Words "as specified" are not sufficient identification.
- D. Identify each submittal item by reference to project name, date, specification section paragraph in which item is specified, or drawings and detail number.
- E. Organize submittals in same sequence as they appear in specification sections, articles or paragraphs and insert in hard 3 ring binders.
- F. Shop Drawings shall show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation and maintenance, physical size, mechanical characteristics, foundation and support details, weight.
 - 1. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of the Contract Documents.
 - 2. Drawings shall be drawn to scale and dimensioned (except piping diagrams not to scale). Drawings may be prepared by vendor but submitted as instruments of Contractor, thoroughly checked and stamped by Contractor before submission to Architect for review.
 - 3. Catalog cuts and published material may be included to supplement scale drawings.

3.2 Operating and Maintenance Instructions and Manuals: In accordance with the following requirements:

- A. Subsequent to completion of balancing and testing operations, this DIVISION is responsible for instructing the Owner's authorized representatives in operation, adjustment and maintenance of mechanical plant. Submit three (3) copies of certificate, signed by Owner's representatives, attesting to their having been instructed.
- B. Before Owner's personnel assume operation of systems, submit three (3) sets of operating

maintenance instructions, manuals, parts lists, on mechanical plant, its component parts including all major equipment and/or that equipment which requires, or for which manufacturer recommends maintenance in a specified manner. Data sheets shall show complete internal wiring, mechanical and electrical ratings and characteristics, catalog data on component parts whether furnished by equipment manufacturer or others, names, addresses and telephone numbers of source of supply for parts subject to wear or electrical failure, and description of operating, test, adjustment, and maintenance procedures.

1. Where data sheets included in manual cover equipment, options, or other features no part of equipment actually furnished, line out these references or otherwise clearly mark so remaining text, diagrams, drawings, schedules, and similar information remaining shall apply specifically to equipment furnished.
 2. Bind data in vinyl covered loose-leaf binders with title index tabs identifying items therein include:
 - a. Energy Recovery Ventilator;
 - b. Cooling Coil;
 - c. Condensing Unit;
 - d. Hot Water Coil;
 - e. Air Distribution;
 - f. Insulation – ductwork;
 - g. Controls;
 3. Submit drafts of instruction sheets to Architect for review before preparing final sets.
 4. Not all items listed above require maintenance however are listed for scope.
- C. RECORD DRAWINGS: Maintain at all times during construction, a complete set of pertinent drawings which shall be maintained correct to show actual construction of mechanical work. Upon completion of work, request a set of reproducible drawings of original drawings from the Architect. Reproducible prints shall be paid for by Contractor. Upon completion of work, transfer all Record Drawing corrections to reproducible drawing and deliver corrected reproducible drawing together with one set of prints to Owner. All corrections made to reproducible drawing shall be of a quality equal to that of original drawings.
- D. GUARANTEE: Contractor shall submit written Guarantee stating that all work under this Section shall be guaranteed against any defects in materials and/or workmanship for a period of one year from date of Notice of Completion and defective work which develops during guarantee period shall be repaired and/or replaced at no additional cost to Owner.
- 3.3 Reports from manufacturers authorized representative certifying their supervision of equipment installation and start-up procedures.

PART 4 - PRODUCT DELIVERY, STORAGE AND HANDLING

- 4.1 Ship equipment in its original package to prevent damage or entrance of foreign matter. Perform all handling and shipping in accordance with manufacturer's recommendations. Provide protective coverings during construction.
- 4.2 Identify materials and equipment delivered to site to permit check against approved materials list, reviewed Shop Drawings.
- 4.3 Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.

PART 5 - DRAWINGS AND COORDINATION WITH OTHER WORK

5.1 DRAWINGS:

- A. For purposes of clarity and legibility, Drawings are essentially diagrammatic to the extent that many offsets, bends, unions, special fittings and exact locations of items are not indicated, unless specifically dimensioned.
- B. Exact routing of piping, ductwork, etc., shall be governed by architectural and structural conditions, obstructions. Contractor shall make use of data in Contract Documents. In addition, Architect reserves right, at no increase in Contract Sum, to make any reasonable change in location of mechanical items, exposed at ceiling and/or walls, to group them into orderly relationships and/or increase their utility. Contractor shall verify Architect's requirements in this regard prior to roughing-in.
- C. Dimensions, ductspace, location of doors, partitions, similar physical features shall be taken from Architectural Drawings, verified at site under this DIVISION. Do not scale drawings. Consult Architectural features, panels, etc. at the approximate location shown on Mechanical Drawings. Coordinate location of all ceiling mounted items with "REFLECTED CEILING PLAN".
- D. Mounting heights of brackets, outlets, etc. shall be as required.

5.2 COORDINATION:

- A. Work out all "tight" conditions involving work under this DIVISION and work in other DIVISIONS in advance of installation. If necessary, and before work proceeds in these areas, prepare Shop Drawings under this DIVISION for review showing all work in "tight" areas. Provide Shop Drawings, additional work necessary to overcome "tight" conditions, at no increase in Contract Sum. Failure to provide Shop Drawings will be at the Contractor's risk.
- B. Differences or disputes concerning coordination, interference or extent of work between SECTIONS shall be decided by Contractor, his decision, if consistent with Contract Documents requirements, and shall be final.
- C. Coordinate electrical interlocks of mechanical equipment with DIVISION 26.
- D. Provide templates, information and instructions to other DIVISIONS to properly locate holes and openings to be cut or provided for electrical work.
- E. Not all offsets in ductwork or piping are shown. Contractor shall decide which item to offset or relocate. Maintain required slope in piping.
- F. Responsibility for problems as a result of not providing shop drawings shall be borne by the contractor.
- G. Round duct may be substituted for rectangular where space permits (except lined duct). If reshaping of rectangular duct is required to fit space it shall be done at no increase of contract sum.

5.3 Large Scale Layout Drawings: In accordance with requirements of SECTION "RECORD DOCUMENTS" prepare large scale detailed layout drawings showing locations of equipment, piping runs, ductwork, and all other elements of mechanical systems provided under this DIVISION. Include sections of all congested areas to show relative position and spacing of affected elements.

5.4 EQUIPMENT ROUGH-IN:

- A. Rough-in locations shown on Mechanical Drawings for equipment furnished by Owner and for equipment furnished under other DIVISIONS are approximate only. Obtain exact rough-in locations from Shop Drawings for Contractor furnished and installed equipment.
- B. Verify mechanical and electrical characteristics of equipment before ordering equipment or starting rough-in. Where conflict exists between equipment and rough-in shown on Drawings obtain clarification from Architect and provide as directed.

PART 6 - PRODUCTS

6.1 MATERIALS

- A. Identify materials, equipment by manufacturer's name, nameplate data. Remove unidentified materials, equipment from site.
- B. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalogue as standard with equipment. Furnish optional or additional accessories as specified.
- C. Where no specific make of material or equipment is mentioned, any first class product of reputable manufacturer may be used, provided it conforms to requirements of system and meets with acceptance.
- D. Equipment, material damaged during transportation, installation operation is considered as totally damaged. Replace with new. Variance from this permitted only with written acceptance.
- E. Provide an authorized representative to constantly supervise work of this DIVISION, check all materials prior to installation for conformance with Drawings, Specifications, and reviewed Shop Drawings.

PART 7 - EXECUTION

7.1 INSTALLATION

- A. Manufacturer's Directions: Follow in all cases where manufacturers of articles furnish directions covering installation points not specified or shown.
- B. Equipment which is required to be field assembled shall be assembled at no extra cost and under the direct supervision of the manufacturer's agent. Prior to the final acceptance submit letters from the manufacturers that this has been done.
- C. Equipment: Accurately set and level with supports neatly placed and properly fastened. Properly fasten equipment in place with bolts to prevent movement in earthquake. No allowance of any kind will be made for negligence on part of Contractor to foresee means of bringing in, installing equipment into position inside building.
- D. Piping and/or Ductwork Systems:
 - 1. Work into complete, integrated arrangement with like elements to make work neat appearing, finished.
 - 2. Run concealed, except as shown otherwise; where exposed, parallel with walls or structural elements; vertical runs plumb, horizontal runs level, parallel with structure or uniformly pitched as appropriate.

3. Install with adequate passageways free from obstructions, as high as practicable to maintain adequate head room, as shown or required. Notify Architect before installation whenever head room of less than 7-feet 6-inches or as called for on drawings will result. Coordinate with work of other DIVISIONS to achieve proper head room as specified in this DIVISION.
 4. Clearance: Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.
 5. Flash and counterflash all pipes and ducts through roof in accordance with requirements of "FLASHING AND SHEET METAL". All work to conform to metal roof manufacturers requirements. Prepare all exposed materials for painting.
 6. Expansion and Contraction: Make adequate provisions, whether those provisions are shown or not.
 7. Cleaning and Closing: Inspect all piping, ductwork and equipment and clean as required before closing. Close all piping and ductwork at end of each day's work.
- E. Devices complete as required for installation of mechanical work.
1. Devices to be of metal only; no wood or combustible material will be permitted.
 2. Hangers, anchors and supports for pipe and duct runs: As shown or required.
 3. Provide concrete inserts for attachment of hangers; subject to structural engineer's review.
 4. Anchors for floor and wall mounted equipment as shown or required.
 5. Supports for wall mounted equipment as shown or required.
 6. Seismic anchors and supports for Zone 3. Reference: S.M.A.C.N.A. "SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS" using Seismic Hazard Level "C" and Connection Level "1".

PART 8 - PERFORMANCE

- 8.1 Concrete: In accordance with the requirements of DIVISION 3.
- 8.2 Sleeves, Chases, and Concrete Inserts:
- A. This DIVISION shall provide, to cause no delay, all required sleeves, chases, concrete inserts, anchor bolts, etc., before concrete is poured, be responsible for correct location, installation of same.
 - B. Sleeves and chases are prohibited in structural members, except where shown or directed by the Architect in writing.
 - C. Embed no piping in concrete or masonry.
 - D. Locating and sizing of openings for ductwork through walls, roof, etc., under this DIVISION. Framing of openings provided by respective DIVISIONS in whose work opening is made.
 - E. Sleeves shall be metal or plastic.
- 8.3 CUTTING AND REPAIRING:
- A. Do all cutting, repairing, including structural reinforcing, necessary for work under this DIVISION.
 - B. Do no cutting or patching without Architect's review. Repair damage done by this cutting equal to original condition in Architect's opinion.
 - C. Assume responsibility for all damage to any part of premises or work of other DIVISIONS, caused by leaks or breaks in piping or equipment furnished and/or installed under this DIVISION during construction and guarantee period.

8.4 OPENINGS:

- A. Contractor shall determine exact location and size of openings required in the building for pipe and ductwork penetrations.

PART 9 - TESTING AND ADJUSTING

- 9.1 Furnish all labor and test equipment required under this DIVISION.
- 9.2 Clean and purge equipment and piping before each test.
- 9.3 Test various mechanical systems in portions as work progresses. Any system or portion previously tested shall become part of any repeated test when it becomes part of distribution or collection system.
- 9.4 Repair leaks by remaking with new material. Makeshift leak stopping methods are not acceptable.
- 9.5 Should any piece of equipment or material fail in any of the tests, immediately remove, replace with new; retest system.
- 9.6 Maintain test pressures for periods stated, or as directed, without loss in pressure except that due to change in temperature or atmospheric pressure during test.
- 9.7 Perform all tests in accordance with requirements and under supervision of authorities having jurisdiction.
- 9.8 After completion of testing and adjustment, operate the different systems and equipment under normal working conditions for two (2) days for seven (7) hours each day, and show specified performance. If, in the opinion of the Architect, performance or equipment or systems is not in accordance with Specifications or submitted data, alter or replace equipment at no increase in Contract Sum. Contractor at his option may order tests from an independent approved laboratory to prove compliance. All such tests shall be at no increase in Contract Sum.
- 9.9 At completion of work, provide written certification that all systems are functioning properly without defects.
- 9.10 TESTING:
 - A. Refrigerant Piping: After the refrigeration system is completed, provide a test of 300 psi for the high side and 150 psi for the low side. Check for leaks by using an electronic leak detector. Pressure shall be maintained for 12 hours.

PART 10 - CLEANING AND PAINTING

- 10.1 Properly prepare exposed work under this DIVISION to be finish painted.
- 10.2 Refinish work supplied with final finish under this DIVISION if damaged under this DIVISION to satisfaction of Architect.

- 10.3 Thoroughly clean all equipment, fans, motors, piping and all other materials under this DIVISION free from all rust scale and all other dirt before any covering or painting is done, or the systems put in operation. Leave in condition satisfactory to the Architect.
- 10.4 Protect all finished surfaces of fixtures with heavy paper pasted thereon, or by other means, throughout the period of construction.
- 10.5 Clean ductwork inside and out before grilles are installed and before fans are operated.
- 10.6 All interior surfaces of ceiling diffusers, registers, grilles, etc., including ductwork visible from inside the building, shall be etched, primed, and painted flat black.

PART 11 - EQUIPMENT IDENTIFICATION

- 11.1 Properly identify each piece of equipment and controls pertaining thereto by means of engraved laminated plastic descriptive nameplates mounted on equipment and controls using round head brass machine screws, pop rivets or contact cement. Cardholders in any form not acceptable. Label shall contain the symbol, duty, capacity, and pressure.
- 11.2 Provide typewritten list of equipment in triplicate, indicating location, service for each piece of equipment, suitably framed with glass front.

END OF SECTION 23 00 00

SECTION 23 05 00 – COMMON WORK RESULTS FOR HVAC

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. DESCRIPTION

1. The requirements of this SECTION apply to all Work of DIVISION 23 where applicable.
2. Where items specified in other SECTIONS of DIVISION 23 conflict with requirements of this SECTION, the former shall take precedence.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All items of materials in each category of equipment shall be of one manufacturer.
- B. Access Doors: Furnish under this DIVISION where shown, or required by Regulatory Agencies and for access to all concealed valves, shock absorbers, coils, unions, control dampers, fire/smoke dampers, etc., even though access doors are not shown for Mechanical Work. Doors shall be in accordance with requirements of SECTION "ACCESS DOORS". Doors in this DIVISION, SECTION "ACCESS DOORS" and DIVISION 08 shall all be of same manufacturer for identical appearance and keying. Sizes: 24-inch x 24-inch minimum for ceilings and 12-inch x 12-inch minimum for walls. Deliver doors to General Contractor for installation. Mark each door to accurately establish its location.
- C. Conform to conditions shown and specified. Coordinate with other trades for best possible assembly of combined Work. Relocate equipment when necessitated by failures to coordinate work or to advise Architect of conflicts in writing.
- D. Use printed descriptions, specifications and recommendations of manufacturers as a guide for installation of work.
- E. Design of mechanical systems is generally based on product of one of the manufacturers cited. Where systems for product installed necessitate modification of systems shown on plans, Contractor is responsible for installation of systems appropriate to product installed.
- F. Materials and Equipment - General Requirements:
 1. New.
 2. Approved for use by Nevada State Fire Marshal and local building inspection department when applicable.
 3. Testing agency labeled or with other identification wherever standards have been established.
 4. Architect reserves right to reject items not in accordance with this Specification either before or after installation.
 5. Comprised to render complete and operable systems; provide additional items needed to complete installation to realize design.
 6. Groups of items having same or similar function shall be by single manufacturer to facilitate maintenance and service.

7. Compatible with space allocated. Modifications necessary to adjust items to space limitations at Contractor's expense.
8. Installed fully operating and without objectionable noise or vibration.

PART 3 - FABRICATION AND MANUFACTURE

- 3.1 Follow manufacturer's directions in all cases where manufacturers of articles used furnish directions covering all points not shown or specified.

PART 4 - EXECUTION

4.1 Electrical Work under this DIVISION shall conform to all requirements of DIVISION 26.

4.2 Sound and Vibration Isolation:

- A. Sound isolate all vibrating equipment from supporting structure, using grommets (around bolts), washers, and sound isolation pads.

END OF SECTION 23 05 00

SECTION 23 05 93 - TEST AND BALANCE

PART 1 - CONDITIONS OF THE CONTRACT

1.1 DESCRIPTION

- A. GENERAL: The Conditions of the Contract (General, Supplementary and other Conditions) and the General Requirements (Sections of Division 01) are hereby made a part of this Section.

1.2 SCOPE

- A. Furnish all labor necessary to provide final adjustment and balancing of HVAC air systems provided under Section 23 00 00.
1. Prepare reports.
 2. Must be able to provide same day response to any temperature or balance related problems.
 3. Make one mid-construction site inspection to review system installation at a time appropriate to ensure proper system operation as intended in the contract documents.
 4. Adjust fan drives as required including any sheaves and or belt changes. Includes adjustable sheave replacement.
 5. Adjust minimum airflows in accordance with schedule on the drawings.
 6. Coordinate with mechanical, control and electrical contractors.
 7. Provide a preliminary review of design drawings and make a written report if any difficulty is anticipated in performing system balance as designed.

1.3 SUBMITTALS

- A. REQUIREMENTS:
1. Furnish evidence that contractor is a certified member of AABC and that all procedures used shall be done in strict compliance with AABC national standards Fifth Edition, 1989.
 2. Provide sample of each type of form to be used.

PART 2 - EXECUTION

2.1 GENERAL

- A. Test and Balance Contractors:
1. Work shall be accomplished by:

Raglen System Balance, Inc.
Reno, Nevada
(775) 747-0100

R.S. Analysis, Inc.
Reno, NV
(775) 323-8866

NO EXCEPTIONS

- B. Control contractor shall have mechanic available to assist balancing contractor as required throughout the balancing process.

C. System air and water balance:

1. The system balance report shall include as a minimum, but not be limited to the following design and actual performance information:
 - a. Horsepower;
 - b. Brake horsepower;
 - c. Revolutions per minute;
 - d. Actual amperage and full load rated current of all motors pumps and fans;
 - e. Cubic feet per minute supply, return and exhaust;
 - f. Static pressures (inlet, outlet and total external);
 - g. Gallons per minute pumps and coils;
 - h. Temperatures across heat wheels.
2. Filters shall be clean at time of testing. Do not attempt balancing until this is verified.
3. Testing and balancing of all ceiling supply, return or exhaust terminals shall be accomplished with Shortridge Air Data Multimeter that has flaps open/flaps closed features. NO EXCEPTIONS.
4. Balancing shall be accomplished in all modes of operation from minimum to maximum flow.
5. Final inspection will not be performed until Test and Balance Report has been provided to Engineer for evaluation.
6. After final balancing of systems, adjustments shall be made to obtain uniform temperatures and to eliminate drafts as required by actual occupancy.
7. This contractor shall adjust drives and belts as necessary to achieve proper air balance. After final balance is achieved, replace adjustable drives with fixed drives.

END OF SECTION 23 05 93

SECTION 23 07 00 – HVAC INSULATION

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. DESCRIPTION

1. Work in this Section:

- a. Supply air ductwork and plenum insulation.
- b. Provide incidental items not shown or specified that belong to the Work described or are required for complete systems.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Duct Insulation: Cover supply air ductwork, outside air ductwork, and exhaust air ductwork between ceiling exhaust registers and ERV unit with glass fiber duct wrap, having minimum thermal resistance of 0.30 per degree F/BTUH/inch at 75-degrees F mean temperature and aluminum foil, skim-kraft vapor barrier facing. 2-inch thick, .75 lb/cu. ft. Owens Corning All Service Foil Faced Duct Wrap Insulation. Exhaust ductwork between ERV unit and weather hood on roof does not require insulation.
- B. Acceptable manufacturers are Owens Corning, Manville, CertainTeed, or Knauf.
- C. Submit samples of all insulation with submittal.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General: Install all insulation in accordance with manufacturer's published instructions. Surfaces being insulated shall be clean, smooth and dry.
- B. Exposed fiberglass will not be allowed.

END OF SECTION 23 07 00

SECTION 23 08 00 - HVAC COMMISSIONING

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. Work in this Section:

1. The HVAC systems commissioning shall include a demonstration by the Contractor that all equipment and control operations comply with the drawings and specifications and with the final test and balance report. The final test and balance report shall be submitted to the Engineer a minimum of 5 working days prior to the scheduled date(s) for the HVAC systems commissioning.
2. HVAC systems commissioning shall be conducted with representatives present from the following entities:
 - a. General Contractor.
 - b. Mechanical Contractor.
 - c. Temperature Control Contractor.
 - d. Test and Balance Contractor.
 - e. Mechanical Engineer.
 - f. Owner's designated representative.
3. The aforementioned representative shall be present during all portions of the testing (and re-testing as required) and shall be equipped to promptly remedy any deficiencies discovered during the commissioning process.
4. Completion and acceptance of the HVAC systems commissioning shall be a condition of Substantial Completion. The building shall be considered "not ready to utilize for its intended use" until such time that the HVAC systems commissioning is successfully completed.

END OF SECTION 23 08 00

SECTION 23 09 23 – DIRECT DIGITAL CONTROLS

PART 1 - CONDITIONS OF THE CONTRACT

1.1 WORK IN THIS SECTION

- A. Furnish and install electric/electronic controls by providing and implementing a local building stand-alone DDC Alerton system.
- B. Programming to meet the intent of the sequence of operation shown in the temperature control drawings.
- C. Adjustment and validation of control system operation to the satisfaction of the City of Sparks Control Department. Instruction of Owner's representative on maintenance and operation of control equipment.
- D. Control schematic diagrams showing control equipment furnish herein.
- E. Provide all incidental items not shown or specified that belong to the Work described or are required or complete system.
- F. Conduit, line and low voltage control wiring.

1.2 SUBMITTALS:

- A. In addition to submittals specified in SECTION 23 00 00. "HVAC", the following are required:
 - 1. Control system drawings containing pertinent data to provide a functional operating system, including a sequence of operation.
 - 2. Drawings of temperature control systems are diagrammatic only and any apparatus not shown such as relays, accessories, etc., but required to make the system operational shall be furnished and installed without additional cost.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Approved Manufacturers: Alerton as installed by Building Control Services (775) 826-8998. No alternates will be considered.

2.2 MATERIALS:

- A. Furnish and install electric control equipment including all peripherals required to perform functions for sequences shown on drawings.
- B. Plenum-rated cable is acceptable for wiring above drop ceilings. Wiring must be in conduit when running exposed or in mechanical rooms.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Electric components shall be installed by Independent Control contractor with Nevada State license C-20 or higher.
- B. Interlock and Control Wiring:
 - 1. Install conduit and wiring in a neat manner. Wiring above drop ceilings shall not encroach into areas reserved for equipment maintenance clearances, and it shall be supported well above the drop ceiling.
 - 2. Provide wiring connections required for the installation of the temperature control system.
 - 3. Conduit in exposed areas shall be parallel to or at right angles to walls, piping, etc. Plenum rated cable is not allowed in exposed areas.
 - 4. Wiring shall be color coded and numbered on both ends of each conductor for easy identification. Colors and numbers shall not change in the middle of a run unless an easily accessible junction box is provided.

3.2 INSTRUCTION AND ADJUSTMENT:

- A. Adjust and validate all thermostats, controllers, valves, relays, etc., provided under this Section.
- B. Furnish three instruction manuals covering function and operation of control system, including as-built control diagrams, on the project for use by Owner's operating personnel. An instruction period lasting not less than two hours shall be provided to completely familiarize operating personnel with temperature control system.

END OF SECTION 23 09 23

SECTION 23 31 00 – HVAC DUCTS AND CASINGS

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

- A. The Conditions of the Contract (General, Supplementary and other Conditions) and the General Requirements (Sections of Division 01) are hereby made a part of this Section.

PART 2 - SCOPE

2.1 WORK IN THIS SECTION:

- A. Ductwork, apparatus, casings and plenums.
- B. Dampers, turning vanes, access doors, and flexible connectors.
- C. Provide all incidental items not shown or specified that belong to the Work described or are required for complete and balanced systems.

PART 3 - PRODUCTS

3.1 MATERIALS:

- A. Low pressure ducts: Supply air ductwork, return air ductwork, exhaust ductwork, and outside air ductwork shall be fabricated from galvanized steel in conformance with SMACNA Standards. Ductwork shall be constructed for 2-inch W.C. minimum.
- B. Flexible Ducts: Flexible ducts shall be Thermaflex M-KE, or approved equal conforming to UL 181, Class 1 requirements, maximum length 5 feet. Furnish sample.
- C. Flexible Connections: At all duct connections to fans, and where indicated, furnish and install heavy INSULATED flexible connection 6" minimum in length. Material used for flexible connections shall be Ventfab as manufactured by Ventfabric Inc. of Chicago, Illinois, "Metal-Fab" manufactured by Duro-Dyne of California or approved equal.
- D. Volume Control Dampers (Low Pressure): Dampers in accordance with Section II of SMACNA "Low Pressure Duct Construction Standards".
- E. Duct and Plenum Sealer: Water based vinyl acrylic duct sealer equal to Design Polymerics DP 1010.
- F. Duct Access Doors: Doors shall be provided with hinges, cam latches, 3/4-inch glass fiber insulated core with felt sealing strips, size 12-inch by 12-inch minimum, Ventlok No. 205.
- G. Turning vanes shall be single thickness, hollow formed with trailing edge. Vanes applicable to all systems. Use only where radius elbows will not physically fit.

PART 4 - INSTALLATION

4.1 GENERAL:

- A. Ducts shall be installed in accordance with SMACNA "Low Velocity Duct Construction Standards".
- B. Ducts shall be constructed and installed as to be completely free from vibration under all conditions of operation.
- C. Ductwork Support:
 - 1. All ductwork supports, hangers, hanger rods, etc. shall be from a single manufacturer. The system shall be designed in accordance with the latest edition of the SMACNA Manual "Guidelines for Seismic Restraints of Mechanical Systems" based on requirements for "Essential Buildings". Details of seismic supports shall be submitted complete with calculations to the Structural Engineer for approval.
 - 2. Acceptable manufacturers are Mason, B-Line and Superstrut.
- D. Supports for horizontal round ducts shall be galvanized strap or angle hangers.
- E. Under no conditions shall the hangers or supports pierce the ducts. The hangers shall be double bolted to standing seams or bracing or be looped continuously around the duct and be blind riveted or sheet metal screwed to its sides and bottom. The hangers shall be attached to the building structure by bolting to concrete inserts, beam clamps or clips as required.
- F. Self-drilling expansion shields may be used when authorized by the Architect. Explosive-type fasteners or studs will be permitted only when approved by the Architect.
- G. Round duct may be substituted for rectangular where space permits (except lined duct). If reshaping of rectangular duct is required to fit space it shall be done at no increase of contract sum.
- H. Elbows shall be made for an easy flow of air, for minimum friction, with inside radius not less than width of duct. Where space does not permit this radius, square elbows with turning vanes shall be used.
- I. Resilient material gaskets shall be installed between all connections of sheet metal to coils and filter casings and connections of aluminum and steel, and shall be airtight.
- J. Access doors shall be provided in sheet metal ducts for access to all coils and control dampers.
- K. All fan connections to the ducts or housing, both inlet and discharge, shall be made with waterproof, fire retardant, neoprene-coated glass fabric flexible duct connections shall be held in place with a heavy metal iron securely attached to eliminate leakage and installed to permit easy removal by the use of a screwdriver.

END OF SECTION 23 31 00

SECTION 23 37 00 - AIR INLETS AND OUTLETS

PART 1 - CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. Related Documents:

1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

2. Description of Work:

- a. Extent of air outlets and inlets work is indicated by drawings and schedules, and by requirements of this section.
- b. Types of air outlets and inlets required for project include the following:
 - 1)Ceiling air diffusers.
 - 2)Registers and grilles.
- c. Refer to other Division-15 sections for ductwork and duct accessories required in conjunction with air outlets and inlets; not work of this section.
- d. Refer to other Division-15 sections for balancing of air outlets and inlets; not work of this section.

PART 2 - QUALITY ASSURANCE

2.1 Manufacturer's Qualifications: TITUS is used as basis of quality and design. Type and performance requirements are scheduled on the drawings. Equals by KRUEGER will be acceptable based upon the following criteria for codes and standards and submittals.

A. Codes and Standards:

- 1. ISO Compliance: Test and rate air outlets and inlets in accordance with ISO Standards 5219 and 3714.
- 2. NFPA Compliance: Install air outlets and inlets in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

PART 3 - SUBMITTALS

3.1 Product Data: Submit manufacturer's technical product data for air outlets and inlets including the following. Supplier shall prepare itemized list of all air supply and return outlets on a room by room basis listing the specified material as well as the proposed substitution. The list shall include the following comparisons based on actual room physical features:

- A. Model number with technical data sheets for each different device.
- B. Neck size and shape.
- C. Face size.
- D. CFM.

- E. Throw of diffuser.
 - F. Throw actually required for each diffuser in the specific room where it is to be installed.
 - G. Terminal velocity.
 - H. Terminal velocity shall be that resulting for each diffuser in the specific room where it is to be installed.
 - I. NC.
 - J. Pressure drop.
 - K. Deflection setting for supply and return registers.
 - L. Sample of each item being substituted.
 - M. Submittal shall include at least one original copy (not photocopy) of each item being submitted. Original copies shall be standard catalog data sheets of manufacturer and incorporate the testing and rating requirements of "Codes and Standards" "ISO Compliance" paragraph required above.
- 3.2 Supplier shall prepare an overlay drawing providing all duct size changes and outlet changes suitable for contractor field use.
- 3.3 Any substitutions resulting in unsatisfactory conditions shall be modified at no cost to the owner.
- 3.4 Shop Drawings: Submit manufacturer's assembly-type shop drawing for each type of air outlet and inlet, indicating materials and methods of assembly of components.

PART 4 - PRODUCT DELIVERY, STORAGE AND HANDLING

- 4.1 Deliver air outlets and inlets wrapped in factory-fabricated fiber-board type containers. Identify on outside of container type of outlet or inlet and location to be installed. Avoid crushing or bending and prevent dirt and debris from entering and settling in devices.
- 4.2 Store air outlets and inlets in original cartons and protect from weather and construction work traffic. Where possible, store indoors; when necessary to store outdoors, store above grade and enclose with waterproof wrapping.

PART 5 - EXECUTION

5.1 INSPECTION

- A. Examine areas and conditions under which air outlets and inlets are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

5.2 INSTALLATION

- A. General: Install air outlets and inlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended functions. Paint all visible ductwork behind diffusers, registers and grilles flat back.

Golden Eagle Little League Fields Expansion
Restroom/Storage Building

1. Diffusers, registers and grilles with removable core assemblies mounted over 9 feet above floor to be complete with earthquake restraints.
2. Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.
3. Locate ceiling air diffusers, registers, and grilles as indicated on general construction "Reflected Ceiling Plans". Unless otherwise indicated, locate units in center of acoustical ceiling modules.

END OF SECTION 23 37 00

SECTION 23 80 00 – DECENTRALIZED HVAC EQUIPMENT

PART 1 - CONDITIONS OF THE CONTRACT

1.1 WORK IN THIS SECTION

- A. Energy Recovery Ventilator;
- B. Heating Coil;
- C. Cooling DX Coil;
- D. Condensing Unit;

1.2 RELATED WORK IN OTHER SECTIONS:

- A. Insulation other than factory furnished with equipment.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Energy Recovery Ventilator:
 - 1. Entire unit shall be AMCA Certified for air flow. AMCA certification of individual components is not acceptable. Certification of individual components does not demonstrate AMCA compliance of components when used in aggregate. Entire unit shall be ETL Certified per U.L. 1995 and bear an ETL sticker. Energy Wheel shall be AHRI Certified, per Standard 1060.
 - 2. Furnish extra materials described as follows that match products installed and that are packaged with protective covering for storage and identified with labels describing contents: filters: (2) set(s) of MERV 8 disposable filters for each unit; one set of energy wheel belts.
 - 3. Manufactured Units: Unit shall be fully assembled at the factory and consist of an insulated metal cabinet, energy wheel, motorized intake damper, motorized exhaust damper, filter assembly for intake and exhaust air, supply air blower assembly, exhaust air blower assembly and an electrical control center. All specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection.
 - 4. Cabinet: Formed double wall insulated metal cabinet, fabricated to permit access to internal components for maintenance. Outside casing: 18 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish. Internal assemblies: 18 gauge, galvanized (G90) steel except for motor supports which shall be minimum 14 gauge galvanized (G90) steel. Access doors shall be hinged. Cabinet shall have four 1-inch duct flanges for connection of supply and exhaust ducts.
 - 5. Cabinet Insulation: Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181. Materials: Fiberglass insulation, thickness: 1 inch (25 mm). Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411. Insulation location and application: Full coverage of entire cabinet exterior to include walls, roof and floor of unit. Insulation shall be of semi-rigid type and installed between inner and outer shells of all cabinet exterior components.
 - 6. Energy wheel: Energy wheel shall be of total enthalpy, rotary air-to-air type and shall be an element of a removable energy wheel cassette. The cassette shall consist of a galvanized

steel framework (designed to produce laminar air flow through the wheel), an energy wheel as specified and a motor and drive assembly. The cassette shall incorporate a pre-tensioned urethane drive belt with a five year warranty. The wheel media shall be a polymer film matrix in a stainless steel framework and be comprised of individual segments that are removable for servicing. Non-segmented energy wheels are not acceptable. Silica gel desiccant shall be permanently bonded to the polymer film and shall be designed and constructed to permit cleaning and servicing. The energy wheel is to have a five year warranty. Performance criteria are to be as specified in AHRI Standard 1060, complying with the Combined Efficiency data in the submittal.

7. Control panel / connections: Energy Recovery Ventilator shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections.
8. Blower: Blower section construction, Supply Air and Exhaust Air: Belt drive motor and blower shall be assembled onto a 14 gauge galvanized steel platform and must have neoprene vibration isolation devices. Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower. Centrifugal blower housing: Formed and reinforced steel panels to make curved scroll housing with shaped cutoff. Forward curved blower (fan) wheels: Galvanized or aluminum construction with inlet flange and shallow blades curved forward in direction of airflow. Mechanically attached to shaft with set screws. Blower performance shall be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".
9. Motors: Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower and pulleys shall be fully machined cast-type, keyed and fully secured to the fan wheel and motor shafts. Electric motors of ten horsepower or less shall be supplied with an adjustable drive pulley.
10. Filters: Unit shall have permanent metal filters located in the outdoor air intake and shall be accessible from the exterior of the unit. MERV 8 disposable pleated filters shall be provided in the intake air stream and MERV 8 filters in the exhaust air stream.
11. Manufacturer to be Greenheck or approved equal.

B. Hot Water Coil:

1. Type WC water coils shall be constructed of seamless copper tubing mechanically expanded into fin collars. Fins shall be die formed plate type. Headers shall be seamless copper with die formed tube holes. Connections shall be male pipe thread (MPT) Schedule 40 Red Brass. 1/8" Vents and drains shall be provided for complete coil drainage. Coils shall be suitable for 250 PSIG working pressure.

C. Cooling DX Coil:

1. Copper tube aluminum fin V-bank type.
2. Furnish with insulated casing and drain pan, and cap tube or expansion valve.
3. Carrier or equal by Rheem or Rudd.

D. Air Cooled Condensing Units:

1. Units shall be designed for use with split system having a remote direct expansion cooling coil.
2. Condensing unit shall consist of high efficiency hermetic compressor, air-cooled condenser, controls, and refrigeration circuit and valves (expansion valve to be furnished with DX coil).
3. Cabinets shall be heavy gauge galvanized steel with baked enamel finish.
4. Compressor shall be equipped with overcurrent protection, a thermostatically controlled crankcase heater, sight glass, a high capacity filter/dryer to remove dirt and moisture, and

- mounted on rubber isolators.
5. Condenser fan shall be direct-connected to a totally enclosed, high efficiency electric motor with PVC coated fan guard.
 6. Connections for refrigerant liquid and suction lines shall be extended outside the cabinet and provide with service valves with gauge connections.
 7. Furnish unit with high and low pressure switches, solid state timed-off control. Low ambient kit and all other accessories listed on the drawings.
 8. Carrier or equal by Rheem or Ruud..

E. Vibration Isolation:

1. All power drive equipment shall be quiet in operation and be free of vibration. Construct and brace metal partitions, ducts, sheet metal housings, etc., so that there will be no vibration or rattling when the system is in operation. Design and construct connections to the equipment so that noise and vibration will not reach the conditioned area through conduit, ducts or piping. Isolators shall be supplied by a single manufacturer to the contractor. The isolator supplier's submittal shall include the complete design of the supplementary base, a tabulation of the design on the isolators including o.d., free, operating and solid heights of springs. Isolation equipment shall be Kinetics, Mason or Vibrex. All HVAC equipment shall be anchored to resist earthquake motion for Horizontal + 1.0 G, and Vertical + 0.33 G.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All selections of equipment shall be made based on published manufacturer's ratings.
- B. All fan to duct connections shall be made with airtight flexible connector to prevent transmission of equipment vibration.
- C. Equipment or material damaged during transportation, installation or operation is considered as totally damaged. Replace with new. Variance from this permitted only with written acceptance of Architect and Owner.
- D. Provide all additional steel supports, etc., as required to support equipment.
- E. Manufacturers recommended installation data shall be strictly adhered to including a safety factor of 5.
- F. Equipment Hangers and Supports:
 1. All equipment supports, hangers, hanger rods, etc., shall be from a single manufacturer. The system shall be designed in accordance with the latest edition of the NUSIG. Details of seismic supports shall be submitted complete with calculations to the Structural Engineer for approval.
 2. Acceptable Manufacturers are Mason Industries, B-Line, or Superstrut.

END OF SECTION 23 80 00

SECTION 31 20 99 - 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: Soils investigation report prepared by Stantec Consulting, Inc.
 - a. The records of investigation of soil or subsurface conditions and logs of test borings are made available by the Architect and are not a part of the Contract. It is expressly understood and agreed that the Architect assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the interpretations set forth therein and there is no warranty or guaranty, either expressed or implied, that the conditions indicated by such investigations or records are representative of those existing throughout such areas or any part thereof, or that material other than, or in proportions different from those indicated, may not be encountered.
 - b. The availability or use of the 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 $\frac{3}{4}$ " 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 $\frac{3}{4}$ " 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. Also overexcavate the existing soils to allow placement of a minimum of 2'-0" of engineered fill beneath all footings, whether interior or exterior, isolated or continuous, and 2'-0" of engineered fill beneath the base of all interior concrete slabs-on-grade. This overexcavation shall extend a minimum of 2'-0" beyond all edges of footings. The depth of these excavations shall be verified and approved by the Geotechnical Engineer prior to placing any engineered fill.
 - 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 03100, "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 31 20 99

SECTION 32 31 00- ROUGH GRADING AND SITE EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

Standard Specifications for Public Works Construction, Latest Edition, as adopted by the City of Sparks.

1.02 SUMMARY

The project requirements for Rough Grading and Site Earthwork shall be those specified in Sections:

- 302 - Subgrade Preparation
- 303 - Unclassified Excavation
- 304 - Unclassified Fill
- 305 - Trench Excavation and Backfill

of the Standard Specifications for Public Works Construction, Latest Edition, the requirements stated herein and the requirements shown on the contract drawings.

1.03 SUBMITTALS

A. Test Reports: Testing laboratory will submit the following reports directly to the architect and shall copy the contractor:

1. Analysis of soil materials, whether procured on or off site, and including fill, backfill, and borrow materials.
2. Verification of each footing subgrade.
3. Comprehensive strength or bearing test reports.

1.04 QUALITY ASSURANCE

A. Testing Laboratory Services: The owner will secure and pay for the services of a geotechnical engineer to classify existing soil materials, to recommend and to classify proposed borrow materials when necessary, to verify compliance of materials with specified requirements, and to perform required field and laboratory testing.

1.05 SITE CONDITIONS

A. Traffic: Do not interfere with or close public ways without permission of governing authorities. Do not interfere with adjacent private facilities.

B. Site Utilities:

1. Advise utility companies of excavation activities before starting excavations. Located and identify underground utilities passing through work area before starting work.
2. Protect existing utilities indicated to remain.
3. Do not interrupt existing utilities without advance notice to and written approval from the owner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Where sufficient approved materials are not available from required excavations on site, obtain and pay for materials from approved sources off site without charge to the owner.

Imported structural fill shall meet the following requirements:

Sieve Size	Percent by Weight Passing	
4 inch.....	100%	
¾ inch.....	70% to 100%	
No. 40.....	15% to 70%	
No. 200.....	5% to 30%	
Percent Passing No. 200 Sieve	Maximum Liquid Limit	Maximum Plastic Index
5% to 10%.....	50.....	20
11% to 20%.....	40.....	15
21% to 30%.....	35.....	10

- B. For each soil material proposed for use as fill or backfill, whether obtained on or off site, testing laboratory shall classify soil material, develop Proctor curve, and perform any other tests required.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protection: Provide markers indicating limits of work and clear identification of items and areas requiring protection.
- B. Provide barricades, warning signs, and warning lights around open excavations as necessary to prevent injury to persons.
- C. The contractor is solely responsible for determining the potential for injury to persons and damage to property.
1. Where such potential is present, take appropriate protective measures.
 2. Protect persons from injury and protect existing and new improvements from damage caused directly or indirectly by construction operations.

3.02 EROSION CONTROL

- A. To the maximum extent practicable, prevent erosion or displacement of soils and discharge of soil-bearing water runoff to adjacent properties and waterways.
- B. Provide erosion control during the entire project in accordance with applicable regulations.

3.04 DEWATERING

- A. Do not allow surface or ground water to flow into or accumulate in excavations.
- B. Do not allow water to flow in an uncontrolled fashion across the project site or to erode slopes or to undermine foundations. Do not allow water to be diverted onto adjacent properties. Arrange excavation operations so as to provide continual and effective drainage of excavations.
- C. Provide and maintain temporary diversion ditches, dikes, and grading as necessary; do not use trench excavations for this purpose. When required by surface or subsurface water conditions, provide sumps, well points, French drains, pumps, and other control measures necessary to keep excavations free of water. When existence of ground water near or above final excavation level is indicated or suspected, provide control measures prior to excavating to water level and maintain water level continuously below working level.

3.05 EXCAVATION

- A. Explosives: Do not use explosives.
- B. General: Excavation includes the removal of any materials necessary to achieve the required subgrade elevations and includes re-use or disposal of such materials.
 - 1. Excavation will not be classified for payment purposes to distinguish between earth, rock, obstructions, or other materials.
- C. Approval of Subgrade: Notify the architect when required elevations have been reached.
 - 1. When required by the architect due to the unforeseen presence of unsatisfactory materials or other factors, perform additional excavation and replace with approved compacted fill material in accordance with the recommendations of the geotechnical report and the Architect's instructions.
 - 2. No additional payment will be made for additional work related to removal and replacement of unsuitable materials in structural areas, as required in conformance with the requirements of the contract drawings and specifications. No payment will be made for correction of subgrades improperly protected against damage from freeze-thaw or accumulation of water, or for correction of otherwise defective subgrades.
- D. Excavation for Pavements: Excavate, shape, and compact to the lines, subgrade elevations, and cross sections indicated.

.06 STORAGE

- A. Stockpile materials to be used for filling and backfilling, including excavated materials classified as satisfactory soil materials, at locations indicated or as directed. Stockpile in a manner to freely drain surface water; cover if necessary to prevent wind-blown dust.
 - 1. Store soil materials without intermixing. Protect from contamination with other soils or debris.
 - 2. Do not stockpile materials inside of drip line of trees to remain.

3.07 BACKFILLING

- A. Installation: Place approved soil materials in layers to required elevations.
 - 1. Do not place material on muddy or frozen surfaces or on surfaces containing frost.
- B. Installation: Place satisfactory soils materials in layers to required subgrade elevations.

3.08 FILLING

- A. Preparation: Verify that area has been stripped of vegetation including roots below grade. Remove and dispose of any unsatisfactory soils.
 - 1. When filling slopes steeper than 1 in 4 rise, plow, step, or break up surfaces to promote bond of new to existing material.
 - 2. Should density of subgrade to receive fill be less than specified for fill, break up and pulverize subgrade to a depth of at least 6 inches, moisture condition if necessary, and recompact to required density at optimum moisture content.
 - 3. If necessary, stabilize or mechanically stabilize fill area as recommended in the geotechnical investigation report. There will be no extra payment for stabilization as required in conformance with the recommendations of the soils report.
- B. Installation: Place fill materials to required elevations in lifts of required depth. Provide fill materials beneath each area as indicated.

3.09 PAVEMENT SUBBASE COURSE PLACEMENT

- A. Place lifts such that compaction true to grade and level is accomplished with a minimum of surface disturbance and segregation or degradation of materials. Maintain grade control and cross section by means of line and grade stakes. Maintain moisture content within prescribed limits during placing and compacting.
- B. When the total thickness of subbase is less than the maximum lift thickness permitted, place material in a single lift. When the total thickness of subbase is greater than the maximum lift thickness permitted, place materials in two or more lifts of uniform thickness with no lift less than 3 inches in thickness.
- C. Place material along the edges of the subbase course so as to maintain compaction of the subbase course. Construct at least a 1 foot width of shoulder simultaneously with each lift of the subbase course.
- D. Cut any overbuild to grade. Should top elevation be lower than allowable tolerances, scarify to a depth of 3 inches, add new material, and recompact to bring to grade within required tolerances.

3.10 COMPACTION

- A. Place materials used in backfilling and filling in layers not exceeding loose depths as follows:
 - 1. Heavy equipment compaction: 8 inches.
 - 2. Hand-operated tampers: 4 inches.
- B. Place material simultaneously on opposite sides of walls, small structures, utility lines, etc. to avoid displacement or overstressing.
- C. In-Place Density Requirements: Compact soil to not less than the values given below, expressed as a percentage of maximum density at optimum moisture content.
 - 1. Paved areas: Bottom 12 inches of subgrade and subsequent lifts: 90 percent.
 - 2. Exterior steps and ramps: Bottom 8 inches of subgrade and subsequent lifts: 90 percent.
 - 3. Fill under building and within 10' of building limits: Bottom 12 inches of subgrade and subsequent lifts: 95 percent.
- D. Moisture Control: During compaction, control moisture of subgrades and subsequent lifts to within tolerances from optimum moisture content as recommended by testing laboratory. Wet surface with water when additional moisture is required. Aerate soil to aid in drying or replace soil when excessive moisture is present.

3.11 GRADING

- A. General: Smooth grade to a uniform surface that complies with compaction requirements and required lines, grades, and cross sections and is free from irregular surface changes.
- B. Provide smooth transition between existing adjacent grades and changed grades. Cut out soft spots, fill low spots, and cut down high spots to conform to required surfaces tolerances.
- C. Slope grades to direct water away from structures and to prevent ponding. Finish subgrade to required elevations within the following tolerance:
 - 1. Paved areas: Plus or minus 0.05 foot.
 - 2. Exterior steps and ramps: Plus or minus 0.05 foot.

3.12 PROOF ROLLING

- A. After completion of required compaction and immediately prior to proceeding with subsequent construction, proof roll in the presence of testing laboratory representative.
- B. Proof roll using a heavy pneumatic-tired vehicle having four tires abreast, each tire loaded to 30,000 pounds and tire inflated to 150 psi. Provide 30 coverage's of the area to be proof rolled, one coverage being defined as the application of one tire print over the entire area. Maintain optimum moisture content during proof rolling. In areas which show pumping or which are otherwise unsatisfactory, undercut fill material and replace with compacted fill, or stabilize in place, as required by the architect.
- C. Proof roll areas to receive:
 - 1. Pavement.
 - 2. Building slabs on grade.

3.13 FIELD QUALITY CONTROL

- A. Testing Laboratory Services: Provide timely notice to testing laboratory. Do not proceed with construction until testing of each subgrade and lift of fill or backfill has been performed and required inspections and approvals have been obtained.
- B. Maximum Density at Optimum Moisture Content: Determine in accordance with ASTM D-1557 (Modified Proctor).
- C. In-Place Density Tests: ASTM D-1556 (sand cone method), ASTM D-2167 (rubber balloon method), or ASTM D-2922 (nuclear method), as applicable.
- D. If testing service reports indicate that subgrade or fills are below specified density, scarify or remove and replace to the required depth, re-compact, and retest at no cost to the owner.

3.14 MAINTENANCE

- A. Completed Areas: Protect from damage by pedestrian or vehicular traffic, freezing, erosion, and contamination with foreign materials.
 - 1. Repair and re-establish grades to specified tolerances in settled, eroded, or rutted areas.
- B. Damaged Areas: Where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction and whether due to subsequent construction operations or weather conditions, restore materials to required conditions: Scarify or remove and replace to the required depth, return to optimum moisture content, and compact materials to the required density before continuing construction.
- C. Correction: Should settling occur within the project correction period, remove finished surfacing, add additional approved material, compact material, and reconstruct surfacing. Construct surfacing to match and blend in with adjacent surfacing as nearly as practicable.

3.15 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove any material not required for use on the project (including unsatisfactory soil, excess satisfactory soil, trash, and debris) and legally dispose of it off the owner's property, at no cost to the owner.

END OF SECTION 32 31 00

SECTION 32 51 00 - WATER SYSTEMS

PART 1 – GENERAL

1.01 SYSTEM DESCRIPTION

The adjacent existing domestic water system is owned by the Truckee Meadows Water Authority (TMWA).

1.02 RELATED DOCUMENTS

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

Standard Specifications for Public Works Construction, Latest Edition, as adopted by the City of Reno.

1.03 CODE COMPLIANCE AND STANDARDS:

A. American Water Works Association – AWWA

1.04 QUALITY ASSURANCE

A. All materials shall be certified new from factory. Pipe, fittings, and valves shall be made in the USA or Canada to AWWA and ANSI standards and suitably stamped. Piping components made in other countries shall not be used unless specifically approved in advance by the Project Coordinator.

Acceptable suppliers for AWWA C900 and C905 pressure water pipe are:
CertainTeed Corporation
Diamond Plastics Corporation
Other equal alternates

B. Backflow prevention devices and installations shall conform to all requirements of the Truckee Meadows Water Authority Backflow Prevention Construction Standards

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Contractor shall be responsible for inspecting materials delivered to site for damage.
2. Materials shall be stored on-site in enclosures or under protective coverings. Materials shall not be stored directly on ground.
3. Joint materials, fittings, valves, and gaskets shall be stored under cover out of direct sunlight.

B. Handling:

1. Pipe, fittings, valves and other accessories shall be handled in such a manner as to ensure delivery to the trench in sound, undamaged condition.
2. Special care shall be taken to avoid injury to coatings and linings on pipe and fittings. Damaged coatings and linings shall be repaired by the Contractor to the satisfaction of the Project Coordinator.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

A. Pipe:

1. 1 & 2 inches: A All service tubing shall meet or exceed the most current version of AWWA Standard C901 and shall be purchased from approved manufacturers. All tubing shall have a Standard Dimension Ratio (SDR) of nine (9).
1": CTS PE 3608, 200 psi Pressure Rating, 1.125" OD.
2": CTS PE 3608, 200 psi Pressure Rating, 2.125" OD

PART 3 - EXECUTION

3.01 TRENCHING, BACKFILLING, AND COMPACTING

A. Trenching:

1. The City of Sparks may limit the amount of trench to be opened at any time.
2. Minimum depth from finished grade to top of pipe is 36".

B. Bedding:

1. Ditch bedding shall conform to TMWA Standard Detail 10H-7.

- C. Backfilling: Backfilling of trenches shall progress as rapidly as construction, testing, and acceptance of work permits.
- D. Damage Repair: Utilities, wall, piping, and other improvements damaged during the course of work shall be repaired to their original condition or replaced by the contractor.
- E. Excess Material: Excess material and debris shall be removed and disposed of, at an approved disposal site, within one week after final approval of installation.

3.02 PIPING INSTALLATION

- A. Cleaning and disinfection:
 - 1. Reference TMWA Appendix 9C for cleaning and disinfection procedures. (Also see appendix O of this document.) Flush line before disinfecting. After disinfecting, hydrostatically test piping. Owner must witness flushing, disinfection and hydrostatic testing before acceptance.

3.03 FIELD QUALITY CONTROL

- A. General: The project coordinator or his representative will conduct field inspections and shall witness all field tests specified in this section. The contractor shall perform field tests and provide labor, equipment, and incidentals required for testing. The contractor shall produce evidence, when required by the project coordinator, that any item of work has been constructed properly in accordance with the contract drawings and specifications.
- B. Field Tests:
 - General: All anchor blocks and restraints shall be complete prior to testing. Concrete supports shall be fully cured. Disinfection completed. All joints exposed for testing.

Piping Hydrostatic Pressure Tests:

- a. Test pressure gauges for a specific test shall have dials indicating not less than one and one half (1-1/2) times nor more than two (2) times the test pressure.
- b. After installation of insulation, anchor blocks, and backfill, hydrostatic pressure shall be applied to 150 psig and allowed to stabilize to ground temperature while maintaining 150 psig, +/- 10 psi. After stabilization, pressure source shall be removed. Piping must hold 150 psig, +/- 10 psi, for at least four (4) hours. Leaks shall be repaired and the test repeated if the pressure does not hold.

END OF SECTION 32 51 00

SECTION 32 60 00 - SEWAGE AND DRAINAGE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

Standard Specifications for Public Works Construction, Latest Edition, as adopted by the City of Sparks.

1.02 SUMMARY

The project requirements for Sewerage and Drainage shall be those specified in Section 306 - Storm Drain, Culverts, and Sanitary Sewer Construction, of the Standard Specifications for Public Works Construction, Latest Edition, the requirements stated herein and the requirements shown on the contract drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

Materials shall conform to the Plans and Standard Specifications for Public Works Construction, 1996 Edition.

POLYVINYL CHLORIDE (PVC) PIPE

- A. Polyvinyl chloride pipe and fittings shall conform to ASTM D3034, SDR 35 with bell and spigot type rubber-gasket joints.

PART 3 - EXECUTION

3.01 REQUIREMENTS

The requirements of Section 306 - Storm Drain, Culverts, and Sanitary Sewer Construction, of the Standard Specifications for Public Works Construction, Latest Edition, shall be incorporated into and made part of the project Contract documents.

END OF SECTION 32 60 00

SECTION 32 72 00 - AGGREGATE BASE COURSE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

Standard Specifications for Public Works Construction, Latest Edition, as adopted by the City of Sparks.

1.02 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain required products from a single manufacturer.

1. Accessories: Provide accessory items only as produced or recommended by manufacturer of primary products.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aggregates for Surfacing and Base:

1. Aggregate shall be Type 2, Class B Aggregate Base as specified in the Standard Specification.

2.02 SOURCE QUALITY CONTROL

A. Testing: Perform the following testing:

1. In accordance with section 308 of the reference specifications, the contractor shall submit proof in the form of test results from an approved commercial testing laboratory that the materials proposed meet the quality and gradation requirements.

PART 3 - EXECUTION

3.01 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.

3.02 APPLICATION

- A. General: Compaction Requirements: Material shall be compacted to a minimum depth of six inches and to the following densities in accordance with ASTM D1557-78: subgrade (pavement areas and roadways): 90 percent relative compaction; base course: 95 percent relative compaction.
- B. Subgrade:
 - 1. Subgrade for base course shall be prepared in accordance with the following sections of the reference specification: 302.02, 302.04, 302.05, 302.06.

3.03 FIELD QUALITY CONTROL

- A. Testing and Inspection: Perform the following field tests:
 - 1. Owner's testing agency shall submit in the form of test results that compaction standards are being achieved as specified.

END OF SECTION 32 72 00

SECTION 32 75 00 - PORTLAND CEMENT CONCRETE SITE PAVEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

Standard Specifications for Public Works Construction, Latest Edition, as adopted by the City of Sparks.

1.02 SUMMARY

The project requirements for site concrete shall be those specified in Sections 311 - Concrete Structures and Masonry Construction and 312 - Concrete Curb, Gutters, Walks, Driveways, and Alley Returns of the Standard Specifications for Public Works Construction, Latest Edition, *the requirements stated herein and the requirements shown on the contract drawings.*

PART 2 - PRODUCTS

2.01 MATERIALS

Portland Cement Conc. (P.C.C.) shall have the following characteristics: 4000 PSI min compressive strength at 28 days with min. of 6.25 sacks of cement per cubic yard of conc. Air entrainment shall be 4-7%, slump shall range from 1" min. to 4" max. All materials shall conform to SSPWC Sec. 202. All site concrete shall be reinforced with collated, fibrillated, polypropylene fibers as manufactured by Fibermesh or approved equal. Use 1 1/2 lbs. per cubic yard.

PART 3 - EXECUTION

3.01 REQUIREMENTS

The project requirements of Sections 311 - Concrete Structures and Masonry Construction and 312 - Concrete Curb, Gutters, Walks, Driveways, and Alley Returns of the Standard Specifications for Public Works Construction, Latest Edition, the requirements stated herein and the requirements shown on the contract drawings.

END OF SECTION 32 75 00

Forms

(to be used following award of bid)

- 1) Contract Form**
- 2) Performance Bond**
- 3) Payment Bond**



PROJECT TITLE

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
CITY OF SPARKS
431 PRATER WAY
PO BOX 857
SPARKS, NV 89432-0857

CONTRACTOR:

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 12/04 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 10/01, CA 00 05, CA 00 12 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 02/99 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 10/01.

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 04/92 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.

(Vendor)

CITY OF SPARKS, NEVADA
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 OBLIGATION 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 _____